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# PROCEEDINGS AND TRANSACTIONS

OF

(THE SOUTH LONDON)

British

Entomological and Natural History Society.

World List abbreviation : *Proc. S. Lond. ent. nat. Hist. Soc.*

1953-54.

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and 4 APPENDICES

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APRIL 1955



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# The South London Entomological and Natural History Society.

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PROCEEDINGS AND TRANSACTIONS  
OF  
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Entomological and Natural History Society

The correct abbreviation for THIS Vol. is :—  
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1953-54

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SEVEN TEXT FIGURES  
and FOUR APPENDICES

PUBLISHED AT THE SOCIETY'S ROOMS:  
BURLINGTON HOUSE, PICCADILLY, LONDON, W.1

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# THE SOUTH LONDON Entomological and Natural History Society

BURLINGTON HOUSE, PICCADILLY, LONDON, W.1

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## OBJECTS

The Society has for its objects the promotion and advancement of research in Biological Science, and its diffusion by means of meetings at the Society's Rooms for the reading of original papers, discussions and lectures, by public exhibitions, by field meetings, by the issue of publications, the formation of typical collections and of a library, and by such other means as the Council may from time to time determine.

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## MEETINGS

Indoor Meetings at Burlington House are generally held twice monthly, on second and fourth Wednesdays, at 6.30 p.m. Field Meetings take place throughout the Summer

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## SUBSCRIPTIONS

Entrance Fee, 7/6. Ordinary Members, £1 11/6 (£1 1/- for members under 21) p.a.; Country Members, £1 1/- (12/6 for members under 21) p.a. Life Membership, Twenty Guineas.

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The Council invites the co-operation of all Naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting specimens.

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## COLLECTIONS, etc.

The Society possesses representative collections of most orders of insects, and an extensive library. These are available at all Ordinary Meetings. Members may borrow books at meetings or by post. Donations of suitable insects and books are much appreciated.

There is also a big collection of lantern slides, mainly of insects in all stages, from which series may be borrowed. Microscopes are available for home use.

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## COMMUNICATIONS

Should be addressed to the Hon. Secretary, F. T. VALLINS, A.C.I.I., F.R.E.S., 4, Tattenham Grove, Tattenham Corner, Epsom, Surrey.



## PAST PRESIDENTS

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1872-4	J. R. WELLMAN (dec.).	1922	E. J. BUNNETT, M.A. (dec.).
1875-6	A. B. FARN, F.E.S. (dec.).	1923-4	N. D. RILEY, F.Z.S., F.E.S.
1877	J. P. BARRETT, F.E.S. (dec.).	1925-6	T. H. L. GROSVENOR, F.E.S. (dec.).
1878	J. T. WILLIAMS (dec.).	1927-8	E. A. COCKAYNE, D.M., F.R.C.P., F.E.S.
1879	R. STANDEN, F.E.S. (dec.).	1929	H. W. ANDREWS, F.E.S.
1880	A. FICKLIN (dec.).	1930	F. B. CARR (dec.).
1881	V. R. PERKINS, F.E.S. (dec.).	1930	C. N. HAWKINS, F.E.S.
1882	T. R. BILLUPS, F.E.S. (dec.).	1931	K. G. BLAIR, B.Sc., F.Z.S., F.E.S. (dec.).
1883	J. R. WELLMAN (dec.).	1932	T. H. L. GROSVENOR, F.E.S. (dec.).
1884	W. WEST, L.D.S. (dec.).	1933	C. G. M. DE WORMS, M.A., Ph.D., A.I.C., F.R.E.S., M.B.O.U.
1885	R. SOUTH, F.E.S. (dec.).	1934	T. R. EAGLES.
1886-7	R. ADKIN, F.E.S. (dec.).	1935	E. E. SYMS, F.R.E.S.
1888-9	T. R. BILLUPS, F.E.S. (dec.).	1936	M. NIBLETT.
1890	J. T. CARRINGTON, F.L.S. (dec.).	1937	F. J. COULSON.
1891	W. H. TUGWELL, Ph.C. (dec.).	1938	F. STANLEY-SMITH, F.R.E.S.
1892	C. G. BARRETT, F.E.S. (dec.).	1939	H. B. WILLIAMS, LL.D., F.R.E.S.
1893	J. J. WEIR, F.L.S., etc. (dec.).	1940	E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.
1894	E. STEP, F.L.S. (dec.).	1941	F. D. COOTE, F.R.E.S. (dec.).
1895	T. W. HALL, F.E.S. (dec.).	1942	S. WAKELY.
1896	R. SOUTH, F.E.S. (dec.).	1943	R. J. BURTON, L.D.S., R.C.S.Eng.
1897	R. ADKIN, F.E.S. (dec.).	1944	STANLEY N. A. JACOBS.
1898	J. W. TUTT, F.E.S. (dec.).	1945-46	Capt. R. A. JACKSON, R.N., F.R.E.S.
1899	A. HARRISON, F.L.S. (dec.).	1947	L. T. FORD, B.A.
1900	W. J. LUCAS, B.A., F.E.S. (dec.).	1948	Col. P. A. CARDEW (dec.).
1901	H. S. FREMLIN, M.R.C.S., L.R.C.P., F.E.S. (dec.)	1949	J. O. T. HOWARD, M.A.
1902	F. NOAD CLARK (dec.).	1950	Air-Marshal Sir ROBERT SAUNDBY, K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S.
1903	E. STEP, F.L.S. (dec.).		T. G. HOWARTH, B.E.M., F.R.E.S., F.Z.S.
1904	A. SICH, F.E.S. (dec.).		E. W. CLASSEY, F.R.E.S.
1905	H. MAIN, B.Sc., F.E.S. (dec.).		F. STANLEY-SMITH, F.R.E.S.
1906-7	R. ADKIN, F.E.S. (dec.).		
1908-9	A. SICH, F.E.S. (dec.).		
1910-11	W. J. KAYE, F.E.S.		
1912-13	A. E. TONGE, F.E.S. (dec.).		
1914-15	B. H. SMITH, B.A., F.E.S. (dec.).	1951	
1916-17	HY. J. TURNER, F.E.S. (dec.).		
1918-19	STANLEY EDWARDS, F.L.S., etc. (dec.).	1952	
1920-21	K. G. BLAIR, B.Sc., F.E.S. (dec.).	1953	

## LIST OF MEMBERS

(Revised to 10th March 1954)

Chief subjects of Study:—*b*, Botany; *bi*, Biology; *c*, Coleoptera; *cr*, Crustacea; *d*, Diptera; *ec. ent*, Economic Entomology; *ent*, Entomology, General; *e*, Exotic; *g*, Genetics; *hem*, Hemiptera; *hym*, Hymenoptera; *l*, Lepidoptera; *mi*, Microscopy; *ml*, Micro-lepidoptera; *mo*, Mollusca; *n*, Neuroptera; *nat. hist*, Natural History; *nat. phot*, Nature Photography; *od*, Odonata; *oo*, Oology; *orn*, Ornithology; *orth*, Orthoptera; *r*, Reptiles; *rh*, Rhopalocera; *t*, Trichoptera; *z*, Zoology.

## HONORARY MEMBERS.

Including Honorary Members appointed under Bye-law 10(a), (Hon.); and Special Life Members appointed under Bye-law 10(b), (S.L.).

DATE OF APPOINT- MENT.	DATE OF JOINING	SOCIETY.	CLASS.	NAME, ADDRESS AND INTERESTS.
8.11.1950.	14. 1.1915.	Hon.		COCKAYNE, E. A., O.B.E., D.M., F.R.C.P., F.R.E.S., 8, High Street, Tring, Herts. <i>l, g</i> .
10. 1.1951.	10. 1.1951.	Hon.		GIFFORD, WALTER S., R.F.D., No. 2, Greenwich, Connecticut, U.S.A. <i>l</i> .
11.11.1953.	1907.	Hon.		ANDREWS, H. W., F.R.E.S., "Spring Cottage", Smuggler's Lane, Highcliffe, Christchurch, Hants. <i>d</i> .
1.1.1947.	24.10.1889.	S.L.		MANSBRIDGE, W., M.SC., "Derwent," 26, Broomfallen Road, Scotby, Carlisle, Cumberland. <i>l, c</i> .
1. 1.1950.	12.10.1899.	S.L.		CARR, Rev. F. M. B., M.A., L.TH., Martin's Close, Mudeford, Christchurch, Hants. <i>l, n</i> .
1. 1.1951.	25. 1.1900.	S.L.		DAY, F. H., F.R.E.S., Blackwell Lodge West, Carlisle, Cumberland. <i>l, c</i> .
1. 1.1953.	1902.	S.L.		HARE, E. J., C.B.E., F.R.E.S., Harrow Place, Pinden, Dartford, Kent. <i>l</i> .

## LIFE, ORDINARY, AND COUNTRY MEMBERS.

YEAR OF  
ELECTION.

1937	ADAMS, R. W., 32, Moor Park Road, Northwood, Middlesex. <i>l</i> .
1951	ALLAN, P. B. M., M.B.E., M.A., F.S.A., F.R.E.S., F.Z.S., No. 4, Windhill, Bishop's Stortford, Herts. <i>l</i> .
1950	ALLEN, Miss D. M., "Cedars," Furzedown College, Welham Road, Tooting, London, S.W.17. <i>nat. hist</i> .
1943	ALLEN, DONALD, F.R.P.S., F.R.S.A., F.R.E.S., 698, Warwick Road, Solihull, Warwickshire. <i>hym, ent, l, nat. phot, mi</i> .
1951	ALLEN, Rev. P. V. M., The Vicarage, 16, Butts Hill Road, Woodley, near Reading, Berks. <i>l</i> .

- 1953 ASAHINA, S., D.Sc., Totsuka 3-chome, 123, Shinjuku-ku, Tokyo, Japan. *od.*
- 1953 ASHBY, G. J., 14, The Ridgway, Kingsbury, London, N.W.9. *ent.*
- 1950 ASHWELL, D. A., The Heights, Galloway Road, Bishop's Stortford, Herts. *g, od, hym, nat. phot.*
- 1946 ASTBURY, C. F., 21, Warwick Gardens, West Kensington, London, W.14. *l.*
- 1950 ATHERLEY, Miss M., 43, Farley Road, Derby. *l.*
- 1934 ATKINSON, J. L., "Down's Cottage," 76, Northwood Road, Tankerton, Kent. *l.*
- 1954 ATTY, DAVID B., M.A., 18, Punchbowl Lane, Dorking, Surrey. *c.*
- 1936 AUGUST, V. E., M.I.T., A.R.I.P.H.H., F.R.H.S., 59, Hillcross Avenue, Morden, Surrey. *ent.*
- 1952 BAILEY, KARL E. J., 73, Botley Road, Oxford. *l.*
- 1952 BAKER, B. R., 2, St. Saviour's Terrace, Field Road, Reading. *l.*
- 1939 BAKER, Capt. D. B., R.A.O.C., F.R.E.S., 21, Quarry Park Road, Cheam, Surrey. *l, c.*
- 1953 BAKER, J. A., B.A., The Old Vicarage, Churt, Surrey. *l.*
- 1947 BALFOUR-BROWNE, Prof., W. A. F., M.A., F.R.S.E., F.R.E.S., F.L.S., Brocklehurst, Collin, Dumfries. *c.*
- 1949 BALL, P. A. J., 66, Westbourne Terrace, London, W.2. *l., orn.*
- 1942 BANNER, JOHN V., M.R.C.S., L.R.C.P., F.R.E.S., "Wykehurst," 41, Varndean Gardens, Brighton 6, Sussex. *l.*
- 1953 BARTON, Major B. C., O.B.E., Castle Mead, Highcliffe, Christchurch, Hants. *l.*
- 1948 BAXTER, L. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1948 BAXTER, R. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1933 BAYNES, E. S. A., O.B.E., F.R.E.S., 2, Arkendale Road, Glengary, Co. Dublin, Eire. *l.*
- 1954 BEAUFOY, S., B.Sc.(ENG.), A.M.I.E.E., F.R.P.S., F.R.E.S., 98 Tuddenham Road, Ipswich, Suffolk. *ent.*
- 1938 BEIRNE, B. P., PH.D., F.R.E.S., F.L.S., Division of Entomology, Science Service Building, Ottawa, Ontario, Canada. *ml.*
- 1949 Bell, C. L., F.R.E.S., 23 Harcourt Road, Redland, Bristol 6. *l.*
- 1947 BEST, A. A., 131, Woodham Lane, New Haw, Weybridge, Surrey. *l.*
- 1949 BIRKETT, NEVILLE L., M.A., M.B., B.CHIR. (CANTAB.), 3, Thorny Hills, Kendal, Westmorland. *l, c, d.*
- 1945 BLASDALE, PHILIP, 10 Quarry Hill Road, Ilkeston, Derby. *ent.*
- 1949 BLATHWAYT, C. S. H., M.A. (OXON), F.R.E.S., "Amalfi," 27, South Road, Weston-super-Mare, Somerset. *l.*
- 1948 BLAXILL, A. D., "St. Marthas," Braiswick, Colchester, Essex. *l.*
- 1942 BLEST, T., "Homestead," Higham Lane, Tonbridge, Kent. *l.*
- 1926 BLISS, A., "Golden Mist," Whitford, near Axminster, Devon. *l.*
- 1925 BLYTH, S. F. P., 6, Hatherley Road, Winchester, Hants. *l.*

## ELECTION.

- 1948 BOLINGBROKE AND ST. JOHN, THE VISCOUNTESS (née FROHAWK, Valezina), Essendene, Cavendish Road, Sutton, Surrey. *nat. hist, ent.*
- 1948 BOLTON, E. L., Lyncombe, Stagbury Avenue, Chipstead, Surrey. *l.*
- 1948 BOWATER, Lt.-Col. W., M.C., B.D.S., T.D., D.L., 41, Calthorpe Road, Edgbaston, Birmingham, 15. *l. heredity.*
- 1944 BOWDEN, S. R. B.SC., A.R.C.S., A.R.I.C., 33, South View, Letchworth, Herts. *l.*
- 1946 BOWSER, E. W., J.P., Tytton Hall, Boston, Lincs. *l.*
- 1946 BOYOE, B., 16, Highland Road, Chichester, Sussex. *l.*
- 1948 BOYES, J. D. C., B.SC., A.R.I.C., A.R.P.S., Wimborne, Millfields, Nantwich, Cheshire. *l.*
- 1946 BRADLEY, J. D., F.R.E.S., 157, South Park Road, Wimbledon, London, S.W.19. *l.*
- 1947 BRETHERTON, F. F., C.B., M.A., F.R.E.S., Ottershaw Cottage, Ottershaw, Surrey. *l.*
- 1933 BRETT, G. A., B.SC., A.R.C.S., D.I.C., F.R.E.S., 2, Claygate Lane, Hinchley Wood, Esher, Surrey. *ent.*
- 1952 BRINDLE, ALLAN, F.R.E.S., 86, Princess Street, Nelson, Lancs. *ent.*
- 1940 BRITTEN, H., M.M., F.R.H.S., F.INST.P.A., "Newholme," 21, Toller's Lane, Old Coulsdon, Surrey. *ent (Chalcididae).*
- 1930 BROOKE, Miss W. M. A., F.L.S., 300, Philip Lane, London, N.15. *ec. ent, b, marine life.*
- 1954 BROWN, F. C., F.Z.S., 6, Osmond Gardens, Wallington, Surrey. *Giant Silk Moths.*
- 1943 BROWN, S. C. S., L.D.S., R.C.S.ENG., H.D.D.EDIN., 142, Richmond Park Road, Bournemouth, Hants. *ml, hym.*
- 1952 BRUSH, H. J., "Larkspur", West Farm Close, Ashtead, Surrey. *ent.*
- 1952 BRYCE, D., The Bungalow, Cliffe, Gt. Harwood, Blackburn, Lancs. *l, dip.*
- 1936 BUCK, F. D., *Vice-President, Lanternist.* 31, Elthorne Road, Holloway Road, London, N.19. *c.*
- 1927 BULL, G. V., B.A., M.B., "White Gables" Sandhurst, Kent. *l.*
- 1946 BURKHARDT, Col. V. R., late R.A., D.S.O., O.B.E., 6, Basile, Lyttleton Road, Hong Kong. *l.*
- 1944 BURNS, B. S., 1, Jamaica Villas, Stoke Road, Gosport, Hants. *l.*
- 1948 BURTON, P. J., L.D.S., R.C.S.ENG., F.R.E.S., "Paysanne," Godshillwood, near Fordingbridge, Hants. *l.*
- 1938 BURTON, R. J., (L.D.S., R.C.S.ENG., Cosey Dene, Blackminster, Evesham, Worcs. *l.*
- 1947 BUSBRIDGE, W. E., Firwood, 4, Mount Harry Road, Sevenoaks, Kent. *l.*
- 1922 BUSHBY, L. C., F.R.E.S., c/o Zoological Society of London, Regent's Park, London, N.W.8. *c, hem.*

- 1953 BUTTERFIELD, A. W., 124, Ashville Road, Leytonstone, London, E.11. *l.*
- 1951 BYERS, F. W., 59, Gurney Court Road, St. Albans, Herts. *l.*
- 1953 CADBURY, MRS. BETTY, 9, Trevor Street, Knightsbridge, London, S.W.7. *l.*
- 1948 CALDERARA, P., A.M.I.E.E., "Stratton Lodge," 26, Manor Road, Barnet, Herts. *l, c.*
- 1945 CARLIER, STUART E. W., F.R.E.S., 6, Warwick Buildings, Warwick Road, Solihull, Warwickshire. *l, c.*
- 1950 CAROLSFELD-KRAUSE, A. G., Bredgade 34, Copenhagen-K, Denmark. *l.*
- 1946 CARTER, R. A., 60, West Street, Dorking, Surrey. *c.*
- 1946 CHALMERS-HUNT, MICHAEL, F.R.E.S., 70, Chestnut Avenue, West Wickham, Kent. *l.*
- 1951 CHANDLER, H. G., 92, Talbot Road, Luton, Beds. *l.*
- 1945 CHARLSON, S., 89, Market Street, Stalybridge, Cheshire. *l, ent, g.*
- 1952 CHEVALLIER, L. H. S., 95, Muswell Hill Road, London, N.10. *l.*
- 1952 CHRISTIE, J., Station House, London Road, Hackbridge, Surrey. *d.*
- 1945 CHRISTIE, L., *Recorder*, Station House, London Road, Hackbridge, Wallington, Surrey. *ent.*
- 1951 CLARKE, C. ASTLEY, M.D., F.R.O.P. (Lond.), High Close, Thorsway, Caldy, Cheshire. *l.*
- 1936 CLASSEY, E. W., F.R.E.S., *Council*, 22, Harlington Road East, Feltham, Middlesex. *l.*
- 1934 COLE, G. A., M.A., F.C.A., Highfield, Westhumble, Dorking Surrey.
- 1953 COLERIDGE, W. L., Ess Hill, Ashburton Road, Newton Abbot, S. Devon. *ent, orn.*
- 1946 COLLIER, Major A. E., c/o Lloyds Bank, 6, Pall Mall, London, S.W.1. *l.*
- 1935 COLLINS, R. J., F.R.E.S., Roslyn, Blackthorne Road, Gt. Bookham, Surrey. *l.*
- 1936 COOPER, B. A., B.SC., A.R.C.S., F.R.E.S., 27, Spilsby Road, Boston, Lincs. *c (Elateroidea), ecology, ec. ent, l, nat. phot. (Life Member).*
- 1923 CORK, C. H., 11, Redesdale Street, Chelsea, London, S.W.3. *l.*
- 1947 CORNELIUS, J. A., 29, Grangecliffe Gardens, South Norwood, London, S.E.25. *l.*
- 1922 COUCHMAN, L. E., F.R.E.S., 35, Browne Street, West Hobart, Tasmania. *l.*
- 1909 COULSON, F. J., *Hon. Curator*, "Burnigill," 24, Springfield Avenue, Merton Park, London, S.W.20. *c, hem, l.*
- 1918 COURT, T. H., F.R.G.S., "Oakleigh," Market Rasen, Lincoln.
- 1943 COUSINS, ROBERT J., A.C.P., M.R.S.T., F.Z.S., F.R.E.S., F.R.S.A., "Little Courts," East Street, Banwell, Somerset. *mo, c.*



- 1947 COX, W. A. A., 65, Bamford Road, Bromley, Kent. *ent.*
- 1950 COXEY, S., 203, Green Lane, Bolton, Lanes. *l.*
- 1953 COXON, G. F., Crosby, Drive Spur, Kingswood, Surrey. *ent.*  
*nat. hist.*
- 1934 CRASKE, J. C. B., F.R.E.S., 33, Hinchley Drive, Hinchley Wood,  
Esher, Surrey. *l.*
- 1937 CRASKE, R. M., 22, Edge Street, Camden Hill, London, W.8. *ent.*
- 1918 CRAUFURD, CLIFFORD, "Denny," Bishop's Stortford, Herts. *l.*
- 1933 CREWDSON, R. C. R., F.R.E.S., "The Grange," Delamere, North-  
wich, Cheshire. *l.*
- 1947 CRIPPS, C. H., M.A., Bulls Head Farm, Eakley Lanes, Stoke Gold-  
ington, Newport Pagnell, Bucks. *l, rh. (Life Member.)*
- 1949 CROSS, G. S. E., A.C.T.S. INC., 31, Avenue Road, Finchley, Lon-  
don, N.12. *l.*
- 1932 CROW, P. N., Ravensdale, Ockham Drive, Ockham Road, East  
Horsley, Surrey. *l.*
- 1950 CRUTTWELL, G. H. W., Old Ford House, Frome, Somerset. *ent.*
- 1954 CUE, P., "Lhasa," Malvern Road, Ashford, Kent. *ent.*
- 1947 CUNNINGHAM, D., M.A., 42, Rae Street, Dumfries. *l, flora.*
- 1950 CURL, B. J. A., 33, Fair Oak Road, Bishopstoke, Eastleigh,  
Hants. *l.*
- 1946 CURRIE, P. W. E., M.C., F.R.E.S., 102, Burdon Lane, Belmont,  
Sutton, Surrey. *hym, orth.*
- 1937 CURTIS, A. E., F.R.E.S., "The Cottage," Ifold Estate, Loxwood,  
Billingshurst, Sussex. *l.*
- 1946 CURTIS, W. PARKINSON, F.R.E.S., M.S.B.E., Ladywell Cottage, Tower  
Road, Branksome Park, Bournemouth, Hants. *l.*
- 1951 DALY, D. W., 3, Stonehill Mansions, London, S.W.16. *ent.*
- 1927 DANBY, G. C., "Sheringham," 31, Albion Road, Sutton,  
Surrey. *l.*
- 1945 DAVIDSON, A. R., 2, Foster Road, Formby, Liverpool. *l, c.*
- 1951 DAVIS, G. A. N., M.R.C.S., L.R.C.P., Holt Wood, Aylesford, Kent. *l.*
- 1933 DEMUTH, R. P., M.A., L.R.I.B.A., 37, Great James Street, London,  
W.C.1. *l.*
- 1930 DENVIL, H. G., F.Z.S., F.R.H.S., 4, Warwick Road, Coulsdon, Sur-  
rey. *l, c.*
- 1947 DEWICK, A. J., Curry Farm, Bradwell-on-Sea, Southminster,  
Essex. *l.*
- 1945 DIXON, C. H., Northbrook Farm, Micheldever, Hants. *ent.*
- 1921 DOLTON, H. L., 36, Chester Street, Oxford Road, Reading, Berks. *l.*
- 1936 DOUDNEY, S. P., "Thurne," 110, Foxley Lane, Purley, Surrey. *l.*
- 1930 DUDBRIDGE, B. J., B.A., c/o The Secretariat, Dar-es-Salaam,  
Tanganyika. *ent.*
- 1949 DUFFIELD, C. A. W., M.C., J.P., F.R.E.S., Pickersdane, Brook, near  
Ashford, Kent. *l, c, hem, homoptera.*
- 1946 DUNBAR, J. G., 15, Shandon Crescent, Edinburgh, 11. *l.*
- 1950 DUNK, H. C., 24, Abbots View, Abbots Rise, Kings Langley,  
Herts. *l.*

- 1952 DYSON, R. C., N.D.H., F.R.E.S., 112, Hollingbury Park Avenue, Brighton 6, Sussex. *l*.
- 1927 EAGLES, T. R., *Hon. Editor*, 32, Abbey Road, Enfield, Middlesex. *l, c*.
- 1943 EASTMURE, D. F., "Granta," 43, Muswell Road, Muswell Hill, London, N.10. *l*.
- 1937 EASTON, N. T., D.F.H., F.R.E.S., 92, Connaught Road, Reading, Berks. *l, g, nat. phot*.
- 1948 ECKFORD, EDWARD, "Oldfields," Pulford, near Wrexham, Denbigh. *l*.
- 1949 EDWARDS, F. H., Rockfield, Abbey Road, Worthing, Sussex. *l*.
- 1945 EDWARDS, G. GRAVELEY, Talbot Croft, St Albans, Herts. *l*.
- 1945 EDWARDS, R. C., Arlesley, Pilgrims' Way, Westerham, Kent. *ent*.
- 1941 EDWARDS, Rev. Canon T. G., M.A., F.Z.S., 93, Alleyn Park, Dulwich, London, S.E.21.
- 1933 ELGOOD, W. S., M.A., North Brink, Wisbech, Cambs. *l*.
- 1950 ELLIS, D. J., 24, Hillside Grove, Mill Hill, London, N.W.7. *l*.
- 1947 ELLIS, J. E., B.SC., 31, Manor Wood Road, Purley, Surrey. *l, d*.
- 1951 ELLISON, ELDON F. D., Youl Grange, Link Road, Eastbourne, and Clifton College, Bristol. *l*.
- 1945 ELLISON, R. ELDON, F.R.E.S., Youl Grange, Link Road, Eastbourne. *l*.
- 1937 EMBRY, B., F.R.E.S., Brocks Ghyll, Newick, Sussex. *l*.
- 1932 ENNIS, L. H., F.C.A., Southery, Milbourne Lane, Esher, Surrey. *l*.
- 1947 EVANS, Miss E., c/o Royal Entomological Society of London, 41, Queen's Gate, London, S.W.7.
- 1945 EVANS, L. J., 73, Warren Hill Road, Birmingham, 23. *l*.
- 1946 FAIRCLOUGH, R., "Blencathra," Deanoak Lane, Leigh, Surrey. *ent*.
- 1947 FARWELL, I. G., F.R.E.S., "Mayfield Villa," Portmore, Lymington, Hants. *l*.
- 1947 FEILDEN, G. ST. CLAIR, B.M./N.L.B.G., London, W.C.1. *ent*.
- 1946 FERGUSON, L. F., L.D.S., R.C.S., "Harley House," Gloucester Road, Teddington, Middlesex. *c*.
- 1930 FERRIER, W. J., F.R.E.S., 86, Portnalls Road, Coulsdon, Surrey. *l*.
- 1940 FFENNEL, D. W. H., Martyr Worthy Place, Winchester, Hants. *l*.
- 1951 FIELD, J. C., 70, Dudley Drive, Morden, Surrey. *Arthropoda*.
- 1943 FORD, E. B., M.A., D.SC., F.R.S., F.R.E.S., The University Museum, Oxford. *ent, g*.
- 1920 FORD, L. T., B.A., 28, Park Hill Road, Bexley, Kent. *l*.
- 1939 FORSTER, H. W., 76, Station Road, Chingford, London, E.4. *c*.
- 1915 FOSTER, T. B., "Downlands," 24, York Road, Selsdon, Surrey. *l*.
- 1948 FRASER, Lt.-Col. F. C., I.M.S.RETD., M.D., M.R.C.S., L.R.C.P., F.R.E.S., 55, Glenferness Avenue, Winton, Bournemouth, Hants. *od, n*.

## ELECTION.

- 1945 FRASER, Major M. G., "Ennerdale," College Avenue, Formby, Lancs. *c.*
- 1952 FRASER, R. A., The Foundry Cottage, Ramsbury, Wilts. *l, c.*
- 1948 FRAZER, J. F. D., B.M., B.CH., 52a, Carlisle Mansions, Carlisle Place, London, S.W.1. *l.*
- 1946 FRIEDLEIN, A. F. E., "Wirostal," 47, Rayleigh Road, Hutton, Essex. *l.*
- 1951 FROHAWK, Mrs. M. J., Essendene, Cavendish Road, Sutton, Surrey. *ent, nat. hist.*
- 1947 GARDNER, A. E., F.R.E.S., Council, 29, Glenfield Road, Banstead, Surrey. *od, l.*
- 1952 GARLAND, W. A., 7, Wherwell Road, Guildford, Surrey. *rh.*
- 1950 GENT, P. J., 3, Union Road, Wellingborough, Northants. *l.*
- 1950 GIBBINS, M. J., 10, Perryfield Road, Crawley, Sussex. *l.*
- 1930 GILLIAT, F. T., B.A., F.R.E.S., 25, Manor Rd., Folkestone, Kent. *l.*
- 1952 GILLMAN, Lt.-Col. H. C. R., M.B.E., R.A., Noads House, Tilshead, Wilts. *ent.*
- 1950 GOATER, B., 27, Hiltingbury Road, Chandlers Ford, Hants. *l.*
- 1936 GOODBAN, B. S., "Avondale", Dunsfold, Godalming, Surrey. *l.*
- 1935 GOODLIFFE, F. D., M.A., Lord Wandsworth Agricultural College, Long Sutton, Basingstoke, Hants. *ec. ent.*
- 1942 GOODSON, A. L., 26, Park Road, Tring, Herts. *l.*
- 1926 GORDON, D. J., B.A., F.R.E.S., Table Office, House of Commons, London, S.W.1. *c, l.*
- 1949 GOULD, A. W., 37, Kirkside Road, Blackheath, London, S.E.3. *c.*
- 1936 GOWING-SCOPES, E., F.R.E.S., "Oakhurst", Oakwood Road, Crofton, Orpington, Kent. *l.*
- 1924 GRANT, F. T., 45, Shepway Avenue, Maidstone, Kent. *l, c.*
- 1951 GREEN, J. A., 61, Brewery Road, Plumstead, London, S.E.18. *l.*
- 1950 GREENWOOD, K. C., M.B., CH.B., "Rydal," 1, Conyers Avenue, Birkdale, Southport, Lancs. *l, ml.*
- 1953 GRIFFITHS, G. C. D., 13, Woodlands Avenue, Finchley, London, N.3. *d (Syrphidae)*
- 1948 GROVES, Miss J. R., B.SC.(HORT.), F.R.E.S., Research Station, East Malling, Maidstone, Kent, and 3, Spencer Drive, East Finchley, London, N.2. *ent.*
- 1950 GULLY, J. G., Howells Bank Farm, Ringmer, Sussex. *l.*
- 1947 HAGGETT, G. M., F.R.E.S., 1, Torton Hill, Arundel, Sussex. *l, ent.*
- 1953 HALL, D. G., 34, Ellerton Road, Wandsworth Common, London, S.W.18. *c.*
- 1949 HALL, STEWART SCOTT, C.B., M.SC., F.R.A.E.S., Head of British Joint Services Mission (Technical Services), 1800K Street N.W., Washington, D.C.
- 1944 HAMMOND, H. E., F.R.E.S., 16, Elton Grove, Birmingham, 27. *l, ent.*
- 1949 HANSON, S. M., F.R.E.S., 167, Gunnersbury Park, Ealing, London, W.5. *l. (Life Member.)*

- 1948 HARBOTTLE, A. H. H., Kenwood, Valley Road, Bude, N. Cornwall. *l.*
- 1943 HARDS, C. H., F.R.E.S., 40, Riverdale Road, Plumstead, London, S.E.18. *l.*
- 1943 HARPER, Comdr. G. W., R.N., F.R.E.S., Neadaich, Newtonmore, Inverness-shire, N.B. *l.*
- 1936 HARRIS, W. H. A., "Kemel," Oak Tree Close, Stanmore, Middlesex. *l.*
- 1951 HARRISON-GRAY, M., 16, Carlton House Terrace, London, S.W.1. *Saturniidae.*
- 1953 HARVEY, J. G., 109, Burton Road, London, S.W.1. *c.*
- 1924 HARWOOD, P., F.R.E.S., Wyrley, Colehill, Wimborne, Dorset. *l, c.*
- 1927 HAWGOOD, D. A., 2, Kingsmead Road, Tulse Hill, London, S.W.2. *l.*
- 1924 HAWKINS, C. N., F.R.E.S., 23, Wilton Crescent, Wimbledon, London, S.W.19. *l, c, g.*
- 1938 HAYNES, R. F., 29, Fairfield Drive, Dorking, Surrey. *l.*
- 1923 HAYWARD, Capt. K. J., F.R.E.S., F.Z.S., F.R.G.S., Instituto Miguel Lillo, Calle Miguel Lillo, 205, Tucuman, Republica Argentina. *l, orn, c.*
- 1935 HEDGES, A. V., F.R.E.S., "Ballavale," Santon, Isle of Man. *l.*
- 1920 HEMMING, A. FRANCIS, C.M.G., C.B.E., F.Z.S., F.R.E.S., 28, Park Village East, Regents Park, London, N.W.1. *l.*
- 1924 HENDERSON, J. L., *Hon. Treasurer*, 6, Haydn Avenue, Purley, Surrey. *c.*
- 1951 HERBULOT, C., 31, Av. d'Eylau, Paris 16e, France. *l.*
- 1949 HERRING, J. E., 2, Adam Street, Burnham-on-Sea, Somerset. *ent, l.*
- 1954 HERVEY, The Rev. Canon G. A. K., M.A.(OXON.), Great Salkeld Rectory, Penrith, Cumberland. *ent, orn, b.*
- 1945 HESLOP, Mrs E. A., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l. nat. hist.*
- 1931 HESLOP, I. R. P., M.A., F.R.E.S., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l, nat. hist.*
- 1946 HEWSON, F., F.R.E.S., 23, Thornhill Drive, Gaisby, Shipley, Yorks. *l, hym parasitica.*
- 1948 HICKIN, N. F., PH.D., B.SC., F.R.E.S., Plummers, Bletchingley, Surrey. *t*
- 1948 HILLABY, J. D., F.Z.S., F.R.E.S., 85, Cholmley Gardens, London, N.W.6. *ent.*
- 1952 HILLIARD, R. D., 54, Gyles Park, Stanmore, Middlesex. *l.*
- 1945 HINTON, H. E., PH.D., B.SC., F.R.E.S., Department of Zoology, Bristol University, Bristol, Glos.
- 1944 HITCHINS, Capt. P. E. N., B.SC., Sickiebank, Horam, Sussex. *ent.*
- 1949 HOARE-WARD, J. W., Box's Farm, Horsted Keynes, Sussex. *l.*

## ELECTION.

- 1953 HODGKINSON, ALEXANDER, A.R.C.A., 12, Kitson Road, Barnes, London, S.W.13. *l*.
- 1943 HOLLEBONE, Comr. L. H. T., O.B.E., R.N., F.R.E.S., Mombasa Institute of Muslim Education, P.O. Private Bag, Mombasa, Kenya.
- 1950 HOLLOWAY, P. H., F.R.E.S., Warwick House, Fair Oak, Eastleigh, Hants. *l*.
- 1946 HOLROYD, GEORGE C., "Silver Birches," 8, Elmside, Onslow Village, Guildford, Surrey, *l*.
- 1950 HONEYBOURNE, T. J., F.R.E.S., "Laceys," 97, Birchwood Road, Wilmington, Dartford, Kent. *l*.
- 1945 HOWARD, A. P., 71, Gills Hill Lane, Radlett, Herts. *ent*.
- 1927 HOWARD, J. O. T., M.A., Wycherley, Deepdene Wood, Dorking, Surrey. *l*.
- 1953 HOWARTH, MRS. HELEN, F.R.H.S., "Arrochar," Barnet Gate, Arkley, Herts. *l, b*.
- 1931 HOWARTH, T. G., B.E.M., F.R.E.S., F.Z.S., *Council*, "Arrochar," Barnet Gate, Arkley, Herts. *l*.
- 1951 HOWELL, P. R., Kingsettle Stud, Cholderton, Salisbury, Wilts. *l, hym*.
- 1934 HUGGINS, H. C., F.R.E.S., 65, Eastwood Boulevarde, Westcliff-on-Sea, Essex. *l, ent*.
- 1939 HULLS, L. G., F.C.S., F.R.M.S., F.R.E.S., Chemistry Branch, Military College of Science, Shrivenham, near Swindon, Wilts. *ent*.
- 1952 HUMPHREY, J. C., R.N., Woodside, Chiddingfold, Lewes, Sussex. *c*.
- 1947 HUMPHREY, S. W., Pear Tree House, Roade, Northamptonshire. *l, rh. (Life Member)*.
- 1933 HUTCHINGS, H. R., 127, Chadacre Road, Stoneleigh, Surrey. *l*.
- 1950 HYDE, G. E., F.R.E.S., 20, Woodhouse Road, Doncaster, Yorks. *l, od*.
- 1953 HYDE, R. A., "Woodside," Reading Road, Finchampstead, Berks. *c*.
- 1950 HYDE-WYATT, B., 108, Lindsay Road, Worcester Park, Surrey. *od, c, l*.
- 1953 IVES, Major D. H., R.A., 9, St Michaels Road, Colchester, Essex. *l*.
- 1940 JACKSON, Capt. REGINALD A., C.B.E., R.N., F.R.E.S., Middle Farm House, Codford St. Mary, Warminster, Wilts. *ent, l*.
- 1923 JACOBS, S. N. A., S.B.ST.J., F.R.E.S., *Trustee and President*, "Ditchling," 54, Hayes Lane, Bromley, Kent. *ml, e.ml*.
- 1948 JANSON, D. B., 44, Great Russell Street, London, W.C.1. *ent. (Life Member)*.
- 1928 JANSON, O. J., F.R.E.S., 15, Kingshill Crescent, St. Albans, Herts, or 46, Beresford Road, Hornsey, London, N.8. *ent*.
- 1925 JARVIS, C. MACKECHNIE, F.L.S., 15, Kingcroft Road, Harpenden, Herts. *c*.



## ELECTION.

- 1938 JARVIS, F. V. L., B.Sc., "Corbière", 33 Greencourt Drive, Bognor Regis, Sussex. *l, g.*
- 1947 JARVIS, R. L., 13, Jackson Road, Bromley, Kent. *l.*
- 1947 JAY, E. P., Surrey Cottage, Littlehampton, Sussex. *l.*
- 1951 JEFFERSON, T. W., 37, Riversdale Terrace, Sunderland, Co. Durham. *l.*
- 1948 JEFFS, G. A. T., Nunsholme, Nuns Corner, Grimsby, Lincs. *l, ent.*
- 1945 JOHNSON, Major-General G. F., C.B., C.B.E., D.S.O., Castlesteads, Brompton, Cumberland. *l, orn.*
- 1952 JOPSON, F. L., Langdale, Higherford, Nelson, Lancs. *l.*
- 1946 KEMP, J. K. C., Perrymead House, Bath, Somerset. *l.*
- 1943 KERSHAW, Col. S. H., D.S.O., Alderman's Place, Aspley Heath, Bletchley, Bucks. *l.*
- 1928 KETTLEWELL, H. B. D., M.A., M.B., B.CHIR., M.R.C.S., L.R.C.P., F.R.E.S., Dept. of Zoology, University Museum, Oxford. *g, l.*
- 1952 KINDRED, A. D., 27, Richmond Avenue, Bedfont, Middlesex. *l.*
- 1933 KING, H., C.B.E., D.S.C., F.R.S., "Birchwood," Brierley Avenue, West Parley, Dorset. *l, orn.*
- 1947 KLIMESCH, J., Donatusgasse 4, Linz-a-Donau, Austria. *ml.*
- 1944 KLOET, G. S., F.Z.S., F.R.E.S., 14, Hawthorne Lane, Wilmslow, Cheshire. *ent.*
- 1952 KNIGHT, F., 90, Mitford Road, Holloway, London, N.19. *l.*
- 1952 KUMMERER-NAEGELE, H., 13, Rue des Fleurs, Mulhouse, (Haut Rhin), France. *l.*
- 1951 LANE, A. W., 178, Ravenscroft Road, Beckenham, Kent. *c.*
- 1947 LANFEAR, A. H., "Highclere," 20, South Eastern Road, Ramsgate. Kent. *l.*
- 1945 LANG, R. M., A.C.A., 85, Cheam Road. E. Ewell, Surrey. *l.*
- 1951 LANGMAID, J. R., 9, Craneswater Park, Southsea, Portsmouth, Hants. *l.*
- 1941 LAST, H. R., F.R.E.S., 12, Winkworth Road, Banstead, Surrey. *c, l.*
- 1946 LATHAM, F. H., F.R.E.S., "The Elms," Mapleborough Green, Redditch, Worcs. *l.*
- 1927 LAWSON, H. B., "Churchmead," Pirbright, Surrey. *l.*
- 1952 LEECH, M. J., "The Spinney," Freshfield Road, Formby, Nr. Liverpool. *l, c.*
- 1914 LEEDS, H. A., 7, Beville, Wood Walton, Huntingdon. *l.*
- 1952 LEES, F. H., F.R.E.S., "The Gables," Maidencombe, Torquay. *l.*
- 1952 LEGROS, A. E., 155, Glenfarg Road, Catford, S.E.6. *hym., arachnidae.*
- 1948 LESTON, D., F.Z.S., F.R.E.S., Hon. Librarian, 44, Abbey Road, London, N.W.8. *hem. (Life Member.)*
- 1948 LETHBRIDGE, Mrs. M. J., The Veterinary Laboratory, New Haw, Weybridge, Surrey. *d, Syrphidae.*
- 1947 LEWIS, E., F.R.E.S., 8, Parry Road, South Norwood, London, S.E.25. *c.*

## ELECTION.

- 1934 LINE, H. V., 11, Priory Avenue, Petts Wood, Orpington, Kent.
- 1951 LING, R. B., The Severells, Rectory Lane, Sidcup, Kent. *l*.
- 1933 LIPSCOMB, Brigadier C. G., Misterton, Somerset. *l*.
- 1937 LISNEY, A. A., M.A., M.B., F.R.E.S., "Dune Gate," Clarence Road, Dorchester, Dorset. *l*.
- 1943 LLOYD, T. A., F.R.E.S., The Red House, Westwood Road, Ryde, I.O.W. *ent*.
- 1948 LOCKINGTON, N. A., M.A., A.B.I.C., 23, Stonards Hill, Loughton, Essex. *ent*.
- 1948 LORIMER, R. I., F.R.E.S., 4, Hill House, Stanmore Hill, Stanmore, Middx. *l*.
- 1950 LOVELL, R., 27, Athenaeum Road, Whetstone, London, N.20. *l*.
- 1954 LYON, F. H., M.B.E., F.R.E.S., Green Headland, Sampford Peverell, Tiverton, Devon. *l*.
- 1953 McCLURE, A. M., Bowyers Court, Wisborough Green, Sussex. *l*.
- 1952 McCRAE, A. W. R., Oak Lawn, Gordon Avenue, Stanmore, Middlesex. *l*.
- 1950 McDERMOTT, Miss C. A., "The Dene," Borough Green, Kent. *rh*.
- 1952 MACKWORTH-PRAED, C. W., F.R.E.S., Castletop, Burley, Hants. *ent*.
- 1949 MACNICOL, D. A. B., M.B., CH.B., 52, St Albans Road, Edinburgh 9. *l ml*.
- 1931 MACNULTY, B. J., PH.D., B.SC., F.R.I.C., 67, Purley Downs Road, Purley, Surrey. *l*.
- 1949 MANLEY, G. E. L., Whales Farm, West Chiltington, Pulborough, Sussex. *l*.
- 1945 MANLEY, Lt.-Col. W. B. L., F.R.E.S., The Guards Club, London, W.1. *ent*.
- 1945 MANLY, G. B., 72, Tenbury Road, King's Heath, Birmingham, 14. *ent, l*.
- 1932 MARCON, Rev. J. N., Christ Church Vicarage, Seaside, Eastbourne, Sussex. *l*.
- 1930 MARSH, Capt. DUDLEY G., Gara-Tor, Pigeon Lane, Eddington, Nr. Herne Bay, Kent. *l*.
- 1950 MARTIN, E. L., 9, Devonshire Road, Harrow, Middlesex. *l, t*.
- 1922 MASSEE, A. M., O.B.E., D.SC., F.R.E.S., East Malling Research Station, Kent. *hem, c, acarina*.
- 1947 MAXWELL, Sir REGINALD M., M.A., G.C.I.E., K.C.S.I., Barford House, St Mary Bourne, Andover, Hants. *ent*.
- 1951 MAY, J. T., Homeland, Beech, Alton, Hants. *l*.
- 1950 MAY, R. M., Berkely Lodge, Highfields, Ashted, Surrey. *l*.
- 1946 MELLOWS, CHARLES, Alliot House, The College, Bishop's Stortford, Herts. *l, hym*.
- 1952 MENZIES, I. S., "Eden Roc", Florida Road, Ferring-by-Sea, Sussex. *c, l, orth*.
- 1946 MERE, R. M., F.R.E.S., Mill House, Chiddingfold, Surrey. *l*.
- 1951 MESSENGER, J. L., B.A., "Oakhill", Oatlands Drive, Weybridge, Surrey. *l*.

## ELECTION.

- 1951 MICHAELIS, H. N., 10, Didsbury Park, Didsbury, Manchester, 20. *l.*
- 1945 MICHAUD, J., PH.D., 22, Routh Road, London, S.W.18. *ent.*
- 1938 MINNION, W. E., 40, Cannonbury Avenue, Pinner, Middlesex. *l.*
- 1952 MONTGOMERY, Major J. R. P., M.C., 17 Parachute Bn. (9D.L.I.)  
T.A., Burt Terrace Drill Hall, Gateshead, Co. Durham. *l.*
- 1946 MOORE, B. P., B.SC., PH.D., F.R.E.S., *Council*, "Montrose," Stoney-  
fields, Farnham, Surrey. *od, l.*
- 1947 MOORE, D. R., Sunnyside Cottage, Westcar Lane, Hersham, Sur-  
rey. *l. (Life Member).*
- 1947 MOPPETT, A. A., B.A., 39, Fairdale Gardens, Hayes, Middlesex.  
*ent.*
- 1951 MORE, D., The Little House, Hockley Road, Rayleigh, Essex. *ent.*
- 1949 MORGAN, H. D., F.R.E.S., 3, Ten Acre Wood, Margam, Port Talbot,  
Glam. *ent.*
- 1920 MORISON, G. D., B.SC., PH.D., F.R.E.S., Dept. Advisory Entomo-  
logy, N. of Scotland Agricultural College, Marischal College,  
Aberdeen, N.B. *ec. ent.*
- 1930 MORLEY, A. M., O.B.E., M.A., F.R.E.S., 9, Radnor Park West,  
Folkestone, Kent. *l.*
- 1953 MORRIS, M. G., F.R.E.S., "Old Timbers," 57, St. Mary's Avenue,  
Shortlands, Kent. *l.*
- 1951 MURGATROYD, J. H., F.L.S., F.R.E.S., F.Z.S., "Arachne", Warren  
Edge Road, Southbourne, Bournemouth, Hants. *arach.*
- 1945 MURRAY, Rev. D. P., F.R.E.S., The Priory, Wellington Street,  
Leicester. *l.*
- 1949 NEWMAN, D. E., 4, Andrew Road, Wallingford, Berks. *l.*
- 1926-36 and 1945 NEWMAN, L. HUGH, F.R.E.S., Chestnut House, Cold  
Blow, Bexley, Kent. *l.*
- 1950 NEWTON, J., B.SC., 11, Oxlease Close, Tetbury, Glos. *l.*
- 1945 NEWTON, J. L., M.R.C.S., L.R.C.P., *Council*, H.M. Prison, Brixton,  
S.W.2. *l, b.*
- 1930 NIBLETT, M., F.R.E.S., 10, Greenway, Wallington, Surrey. *galls.*
- 1953 NISSEN, C. L., Flat 10, 250 South Norwood Hill, London, S.E.25. *l.*
- 1938 ODD, D. A., "Yew Tree Cottage", South Street, South Chailey,  
Lewes, Sussex. *l.*
- 1932 O'FARRELL, A. F., B.SC., A.R.C.S., F.R.E.S., New England Univer-  
sity College, Armidale, N.S.W., Australia. *od, cr, ent.*
- 1934 OLIVER, G. B., "Corydon," Amersham Road, Hazlemere, High  
Wycombe, Bucks. *l.*
- 1943 OLIVER, G. H. B., "Corydon," Amersham Road, Hazlemere,  
High Wycombe, Bucks. *l.*
- 1952 OLLEVANT, D., 3, Salcombe Drive, Morden, Surrey. *l, ml.*
- 1952 OLSEN, E. T., Hersegade 5, Roskilde, Denmark. *ml.*
- 1945 OWEN, GODFREY V., Orford, 63, Manor Park Road, West Wick-  
ham, Kent. *l.*
- 1951 OWERS, D. E., 44, Demesne Road, Wallington, Surrey. *l, c, od.*

## ELECTION.

- 1942 PARFITT, R. W., 4, Brind Park Terrace, Sandhurst, Camberley, Surrey. *l*.
- 1946 PARMENTER, L., F.R.E.S., 94, Fairlands Avenue, Thornton Heath, Surrey. *d*. (*Life Member*.)
- 1948 PARRY, J. A., F.R.E.S., "Cavendish", North Holmes Road, Canterbury, Kent. *l, c*.
- 1949 PARSONS, R. E. R., F.R.E.S., I.P., Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. *l*.
- 1950 PAYNE, J. H., 10, Ranelagh Road, Wellingborough, Northants. *rh, breeding*.
- 1940 PAYNE, R. M., 8, Hill Top, Loughton, Essex. *c, od, orth, b*. (*Life Member*.)
- 1953 PEACEY, A. F., Hillside, Brimscombe, Stroud, Glos. *ml*.
- 1940 PELHAM-CLINTON, EDWARD C., F.R.E.S., 34, Craigmillar Park, Edinburgh, 9. *l*.
- 1928 PERKINS, J. F., B.SC., F.R.E.S., 95, Hare Lane, Claygate, Surrey. *hym*.
- 1944 PERRY, K. M. P., 15, Roundwood Way, Banstead, Surrey. *c*.
- 1950 PETERS, WALLACE, M.B., B.S., M.R.C.S., L.R.C.P., F.R.E.S., 175, Lauderdale Mansions, London, W.9. *ent, l*.
- 1953 PETERSEN, K., St. Albans, Upper West Street, Reigate, Surrey. *l*.
- 1946 PHELPS, C. C., M.B.E., 2, Gonville House, Manor Fields, Putney Hill, London, S.W.15. *l*.
- 1945 PHILPOTT, V. W., F.R.E.S., Rose Cottage, Watergate Lane, Broadmayne, Dorset. *l*.
- 1933 PINNIGER, E. B., F.R.E.S., "Littlecote", 19, Endlebury Road, Chingford, London, E.4. *od, n, l*.
- 1949 PLATTS, J. H., Green Shutters, Manthorpe Road, Grantham, Lincs. *l*.
- 1946 PLAYFORD, F. L., c/o British Sailors Society, 15/17 Marconistraat, Rotterdam W., Netherlands. *r*.
- 1947 POLACEK, V. B., Brandys-nad-Labem, c.p. 601, 1 patro, Komen-skeho-ulice, Czechoslovakia. *b, ent, orn*.
- 1933-40, 1950 POOLLES, S. W. P., 8 New Court, Lincolns Inn, London, W.C.2. *l*.
- 1949 POPHAM, W. J., 89, Frederick Place, Plumstead, London, S.E.18. *l*.
- 1953 POUNCE, A. G., Laurel Villa, Meopham, Kent. *ent*.
- 1953 PREVETT, P. F., B.SC., A.R.C.S., 13, Courtney Road, Waddon, Surrey. *c*.
- 1950 PRICE, G. C., "Alpha," 67, Cornyx Lane, Solihull, Warwickshire. *l*.
- 1948 PRICHARD, R., "Lincona," Woodcroft Lane, Bebington, Cheshire. *l, ml*.
- 1948 PRIDEAUX, A. G., B.A., Union Club, Carlton House Terrace, London, S.W.1. *ent (rh), orn*.
- 1945 PUREFOY, J. BAGWELL, c/o Upper Tilt Works, Cobham, Surrey. *l*.

## ELECTION.

- 1947 QUARRINGTON, C. A., A.M.BRIT.I.R.E., "Pennyfields," Bagshott Road, Chobham, Surrey.
- 1945 QUIBELL, WILLIAM, High Street, Brampton, Huntingdon. *l*.
- 1949 QUINNEY, L. G., 36, Mount Pleasant, Reading, Berks. *ent*.
- 1922 RAIT-SMITH, W., F.Z.S., F.R.E.S., F.R.H.S., *Trustee*, "Hurstleigh," Linkfield Lane, Redhill, Surrey. *l*.
- 1946 RANSOME, Major-General A. L., C.B., D.S.O., M.C., The Close, Braishfield, Romsey, Hants. *rh*.
- 1953 RAWLINGS, C. J., 32, Ferguson Avenue, Gidea Park, Romford, Essex. *l*.
- 1946 RAY, H., Mill House Cottage, Bishopstoke, Hants. *rh*.
- 1952 REID, J. F., 19, High Street, Leighton Buzzard, Beds. *l*.
- 1950 REID, W., A.M.I.C.E., 6, Whirlow Park Road, Sheffield, 11, Yorks. *ent*.
- 1953 RENFREW, C., F.R.I.C.S., F.A.I., Lanhill, Bourton-on-the-Water, Glos. *l*.
- 1952 RICHARDS, A. W., M.A., B.SC., Nether Edge, Chapel Lane, Hawley, Camberley. *od, orth, l, ml, Pyralidae*.
- 1945 RICHARDS, O. W., M.A., D.SC., F.R.E.S., Department of Zoology, Imperial College of Science and Technology, South Kensington, London, S.W.7. *ent*.
- 1948 RICHARDSON, A. E., 391, Malden Road, Worcester Park, Surrey. *l*.
- 1942 RICHARDSON, AUSTIN, M.A., F.R.E.S., Beaudesert Park, Minchinhampton, Glos. *l*.
- 1936 RICHARDSON, N. A., 11, Windsor Street, Bletchley, Bucks. *l*.
- 1908 RILEY, Capt. N. D., C.B.E., F.R.E.S., F.Z.S., 7, McKay Road, Wimbleton, London, S.W.20. *l*.
- 1953 RIORDAN, B. D., 75, Blenheim Road, North Harrow, Middlesex. *c*.
- 1953 RIVERS, C. F., 98, Windsor Road, Cambridge. *l (virus diseases of lep. larvae)*.
- 1910 ROBERTSON, G. S., M.D., "Struan," Storrington, near Pulborough, Sussex. *l*.
- 1946 ROBINSON, B. H. B., "St Martins," 35, Woodcote Hurst, Epsom, Surrey. *l, c*.
- 1949 ROBINSON, H. S., F.R.E.S., Lower Farringdon, Alton, Hants. *l*.
- 1951 ROBSON, J. P., 10, Vane Road, Barnard Castle, Co. Durham. *l*.
- 1953 ROCHE, C. G., A.C.A., Talbot House, 42, Trinity Square, London, E.C.3. *hym*.
- 1942 ROCHE, P. J. L., M.R.C.S., L.R.C.P., F.R.E.S., c/o D.M.S., Lagos, Nigeria. *c, hem, e.l*.
- 1953 ROSE, IAN C., "Shrublands", Mistley, Essex. *ent*.
- 1932 RUDLAND, W. LEWIS, F.R.E.S., 436, Hythe Road, Ashford, Kent. *l*.
- 1947 RUMSEY, F., *Council*, 46, Warren Road, Banstead, Surrey. *l*.
- 1949 RUNGE, C., 11, St. Andrews Road, Caversham, Reading, Berks. *l, hym*.
- 1932 RUSSELL, A. G. B., C.V.O., F.R.E.S., Clarenceux King of Arms, "Scarbank," Swanage, Dorset. *l*.

## ELECTION.

- 1890-93 and 1915 RUSSELL, S. G. CASTLE, Stokesay, Bridge Road, Cranleigh, Surrey. *l*.
- 1952 RUSSWURM, A. D. A., F.R.E.S., 1, Langley Oaks Avenue, Sandhurst, Surrey. *l*.
- 1950 RYLE, G. B., DIP.FOR.(OXON.), "Caio," Alders Road, Reigate, Surrey. *Forest ent, hem*.
- 1946 SAUNDBY, Air-Marshall Sir ROBERT H. M. S., K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S., Oxleas, Burghclere, near Newbury, Berks. *l*.
- 1947 SAUNDERS, J. M. K., 27, Canonbury Avenue, Pinner, Middlesex. *l (especially rh.)*.
- 1945 SAUNT, J. W., A.L.S., "Riverview," Minerva Road, East Cowes, I.O.W. *hym, ent*.
- 1927 SCOTT, Col. E., D.S.O., M.D., "Suomi," Westwell, Ashford, Kent. *l*.
- 1952 SCUDDER, G. G. E., 3, Six Acre Cottages, Fawkham, Dartford, Kent. *Lycaenidae*.
- 1948 SCULTHORP, A. H., 46, Pick Hill, Waltham Abbey, Essex. *c*.
- 1946 SELF, K. W., 53b, Earls Avenue, Folkestone, Kent. *ent*.
- 1923 SEVASTOPULO, D. G., F.R.E.S., c/o Ralli Bros., Ltd., P/O Box 401, Kampala, Uganda. *l (Life Member.)*
- 1951 SHAW, R. G., 5, Barnham Road, Chingford, London, E.4. *l, hem*.
- 1947 SHORT, H. G., M.Sc., 23, The Drive, Esher, Surrey. *l*.
- 1948 SIGGS, L. W., 10, Repton Road, Orpington, Kent. *l*.
- 1948 SIMS, J. H., Chestnut Cottage, Sounding Arch Road, Nr. Romsey, Hants. *ent, l*.
- 1939 SIVITER SMITH, P., F.R.E.S., 21, Melville Hall, Holly Road, Edgbaston, Birmingham, 16. *l*.
- 1948 SMALL, H. M., Stones Cottages, Skellingthorpe, Lincs. *l, od*.
- 1952 SMITH, A., 23, First Avenue, Heworth, York. *l, c*.
- 1953 SMITH, D. S., F.R.E.S., 87, Willingdon Road, Eastbourne, Sussex. *l*.
- 1941 SMITH, Lieut. FDK. WM., R.N.V.R., Woottons Cottage, Bucklebury Place, Woolhampton, Berks. *l, hym. (Life Member.)*
- 1945 SMITH, F/Lt. M. W. P., 166, Bromham Road, Bedford. *l*.
- 1920-25 and 1939 SMITH, S. GORDON, F.L.S., F.R.E.S., "Estyn," Boughton, Chester. *ent*.
- 1938 SNELL, B. B., F.R.E.S., "Woodsome," Bromborough, Cheshire. *l*.
- 1946 SOUTHWOOD, T. R. E., B.Sc., A.R.C.S., F.R.E.S., Parrock Manor, Gravesend, Kent. *ent, hem, c, ecology*.
- 1949 SPENCER, K. A., B.A., F.R.E.S., Council, 11, Christchurch Hill, London, N.W.3. *l*.
- 1947 SPERRING, A. H., Slindon, Fifth Avenue, Warblington, Hants. *l*.
- 1950 SPITTLES, C. E., 95, Tring Road, Aylesbury, Bucks. *l*.
- 1943 SPREADBURY, W. H., 35, Acacia Grove, New Malden, Surrey. *nat. hist*.
- 1920-32 and 1938 STAFFORD, A. E., "Corydonis," 83, Colborne Way, Worcester Park, Surrey. *l*.

- 1953 STALLWOOD, B. R., 19, Southfield Gardens, Strawberry Hill, Twickenham, Middlesex. *l*.
- 1949 STANLEY, F. C., F.R.E.S., "Swanmore," Bowes Hill, Rowlands Castle, Hants. *l. c*.
- 1927 STANLEY-SMITH, F., F.R.E.S., *Vice-President*, "Hatch House," Pilgrims' Hatch, Brentwood, Essex. *l*.
- 1954 STANNERS, Comdr. L. S., R.N.Z. NAVY, "Westhanger Place," Westbrook Road, Godalming, Surrey. *l*.
- 1937 STEDALL, H. P. P., Chiltern Manor, Great Missenden, Bucks. *ent*.
- 1938 STERLING, Major D. H., R.A.P.C. *l*.
- 1942 STIDSTON, Eng. Capt. S. T., R.N., F.R.E.S., "Ashe," Ashburton, Devon. *l*.
- 1936 STIGANT, Miss B., Flat 6, 99, Crawford Street, London, W.1. *hortic. ent*.
- 1952 STORACE, LUCIANO, Museo Storia Naturale, Via Brigata Liguria, 9, Genoa, Italy. *l*.
- 1924 STOREY, W. H., Fairstead, Long Road, Cambridge. *ent*.
- 1945 STOUGHTON-HARRIS, G., M.A., F.C.A., F.R.E.S., "Rosegarth," Waldens Road, Horsell, Woking, Surrey. *ent*.
- 1948 STRUTHERS, F. M., 143a, Gander Green Lane, Cheam, Surrey. *l*.
- 1929 STUBBS, G. C., Egremont House, Ely, Cambs., and Survey Office, Kuala Lumpur, Malaya.
- 1939 SUMMERS, E. J., 45, Mulgrave Road, Sutton, Surrey. *c, hem*.
- 1934 SUTTON, GRESHAM R., 6, Kenilworth Gardens, Loughton, Essex. *l, c*.
- 1950 SWAIN, H. D., M.A., F.R.E.S., *Council*, 47, Dryburgh Road, Putney, S.W.15. *l, hy, c, hem*.
- 1950 SYMES, H., M.A. (OXON), 52, Lowther Road, Bournemouth, Hants. *l*.
- 1916 SYMS, E. E., F.R.E.S., F.Z.S., *Vice-President*, 22, Woodlands Avenue, Wanstead, London, E.11. *n, orth, od, t*.
- 1942 TALBOT DE MALAHIDE, THE LORD, 2, Devonshire Street, London, N.W.1. *l*.
- 1922-44 and 1952 TAMS, W. H. T., F.R.E.S., 20, Ranelagh Avenue, Fulham, London, S.W.6. *ent*.
- 1950 TAYLOR, A. S., 364, Burley Road, Leeds, 4. *l*.
- 1941 TAYLOR, H. G. W., 11, Old Forge Way, Sidcup, Kent. *l*.
- 1934 TAYLOR, J. O., 64, Great Thrift, Petts Wood, Kent. *l*.
- 1925 TAYLOR, J. SNEYD, M.A., F.R.E.S., P.O. Box 597, Port Elizabeth, South Africa. *l*.
- 1949 TEMPLE, Miss VERE, F.R.E.S., King's Chase, Tollard Royal, Salisbury, Wilts. *l, hym, orth, od*.
- 1931 THOMPSON, J. ANTONY, M.A., Milton Lodge School Wells, Somerset. *l, g*.
- 1952 THORN, Miss B. A., "Paviott", 16, Springfields, Broxbourne, Herts. *l*.
- 1952 THORNTON, J., 43, Barnes Street, Clayton-le-Moors, Accrington, Lancs. *l*.



## ELECTION.

- 1951 THORNTON, R., 51, Richlands Avenue, Stoneleigh, Ewell, Surrey. *l*.
- 1946 THORPE, JOHN, F.R.E.S., Perrivale, Elmore Lane, Quedgeley, Glos. *l, c, b*.
- 1950 THORPE-YOUNG, D. W., A.I.A.C., F.Z.S., 11, Waverley Way, Carshalton Beeches, Surrey. *ent*.
- 1950 THORPE-YOUNG, Mrs. M., 11, Waverley Way, Carshalton Beeches, Surrey. *l*.
- 1945 TIMMS, C., F.R.E.S., 524a, Moseley Road, Birmingham, 12. *d*.
- 1953 TORLESSE, Rear Admiral A. D., C.B., D.S.O., Old Place, Lee-on-Solent, Hants. *l*.
- 1948 TORSTENIUS, STIG, Narvavagen 27, Stockholm, Sweden. *l*.
- 1950 TROUGHT, TREVOR, M.A., F.R.E.S., c/o Ministry of Agriculture, Amman, Kingdom of Jordan. *l*.
- 1948 TRUNDELL, E. E. J., 6, Arragon Gardens, West Wickham, Kent. *ent, l*.
- 1948 TUBBS, Mrs M., 9, Lingfield Road, Wimbledon Common, S.W.19. *rh*.
- 1947 TUBBS, R. S., O.B.E., A.R.I.B.A., 9, Lingfield Road, Wimbledon Common, S.W.19. *rh*.
- 1934 TUNSTALL, H. G., 11, St James Avenue, Ewell, Surrey. *l*.
- 1940 TURNER, A. D., 19, Manor Close, Kingsbury, London, N.W.9. *ent*.
- 1948 TURNER, A. H., F.Z.S., F.R.E.S., F.R.MET.S., Forest Drive, Bickenhall, Hatch Beauchamp, Taunton, Somerset. *ent, insect migration, conchology. (Life Member.)*
- 1944 TURNER, H. J., "Casita," 240, Iford Lane, Southbourne, Nr. Bournemouth, Hants. *l*.
- 1943 TURNER, J. FINCHAM, 68, Oakhill Road, Sutton, Surrey. *l, hym*.
- 1953 TWEEDIE, M. W. F., M.A., C.M.Z.S., Raffles Museum, Singapore 6, Malaya. *l*.
- 1952 UFFEN, R. W. J., 4, Vaughan Avenue, Stamford Brook, W.6. *l, hym, d*.
- 1945 VALENTINE, ARTHUR, 5, Vicars Close, Wells, Somerset. *ent*.
- 1922-24, 1937-41, 1947 VALLINS, F. T., A.C.I.I., F.R.E.S., *Hon. Secretary*, 4, Tattenham Grove, Tattenham Corner, Epsom, Surrey *Lycaenidae. (Life Member.)*
- 1951 VARLEY, Prof. G. C., M.A., PH.D., F.R.E.S., F.Z.S., Hope Dept. of Entomology, University Museum, Oxford. *hym, d*.
- 1951 VIETTE, P. E. L., Paris Museum (Entomology), 45 bis R. de Buffon, Paris 5, France. *l*.
- 1949 WADE, D., 17, Waldegrave Avenue, Holderness Road, Hull, Yorks. *l, orn*.
- 1929-31 and 1944 WAINWRIGHT, CHARLES, B.SC., F.R.I.C., 42, St. Bernards Road, Olton, Warwickshire. *l*.
- 1929 WAINWRIGHT, J. CHAS., 9, Priory Road, Hook Road, Surbiton, Surrey. *l*.
- 1911 WAKELY, Sir LEONARD D., K.C.I.E., C.B., 37, Marryat Road, Wimbledon, London, S.W. 19. *l*.

## ELECTION.

- 1947 WAKELY, L. J. D., O.B.E., M.A., Cottingley, Anderson Road, Madras. *l.*
- 1930 WAKELY, S., *Council*, 26, Finsen Road, Ruskin Park, London, S.E.5. *l.*
- 1949 WAKEMAN, C. M., 28, Sandfields Road, Warley, Birmingham. *ent.*
- 1951 WALKER, D. H., 90, Whytecliffe Road, Purley, Surrey. *l.*
- 1953 WALLIS, J. L. P., A.R.I.C.S., Kingswood Hotel, Gillingham, Kent. *ent, l.*
- 1935 WALLIS-NORTON, Capt. S. G., 2 Victoria Mansions, Eastbourne, Sussex. *ent. (Life Member.)*
- 1936 WARRIER, R. EVERETT, 99, Braidwood Road, London, S.E.6. *l.*
- 1939 WATKINS, N. A., M.A., F.R.E.S., Soldon, Druid Road, Stoke Bishop, Bristol, 9, Glos. *l.*
- 1945 WATKINS, O. G., F.R.E.S., 20, Torr View Avenue, Peverell, Plymouth, Devon. *l, od.*
- 1920 WATSON, D., "Woodend," Lower Road, Fetcham, Leatherhead, Surrey. *l.*
- 1945 WATSON, R. W., F.R.E.S., 15, Halstead Road, Bitterne Park, Southampton, Hants. *l.*
- 1926-27, 1928-38, 1948 WATTS, W. J., F.R.E.S., "Glaslie," First Avenue, Stanford-le-Hope, Essex. *c.*
- 1947 WEAL, R. D., 124, Marmion Avenue, South Chingford, London, E.4. *c.*
- 1945 WEBB, HARRY E., F.R.E.S., *Council*, 20, Audley Road, Hendon, London, N.W.4. *l.*
- 1945 WEDDELL, B. W., 13, The Halve, Trowbridge, Wilts. *ent.*
- 1911 WELLS, H. O., "St Hilary," 4, Boleyn Avenue, East Ewell, Surrey. *l.*
- 1953 WEST, B. B., 1, Pond Square, London, N.6. *l, od.*
- 1947 WEST, B. K., Branksea, 193, Shepherd's Lane, Dartford, Kent. *l.*
- 1945 WHEELER, A. S., "Courtside," 21, Shelveys Way, Tadworth, Surrey. *l.*
- 1948 WHICHER, L. S., F.R.E.S., A.I.A.E.E., 6, Chisholm Road, Richmond, Surrey. *c.*
- 1949 WHITE, Miss E. M. S., DIP. HORT. (READING), F.R.H.S., County Education Office, County Hall, Ipswich, Suffolk. *agric. ent, nat. hist.*
- 1946 WHITEHORN, K. P., F.R.E.S., 205, Hither Green Lane, Lewisham, London, S.E.13. *l.*
- 1953 WIFFEN, R. C. G., 83, Inverness Terrace, London, W.2. *c.*
- 1946 WILD, E. H., 112, Foxearth Road, Selsdon, Surrey. *l.*
- 1946 WILDRIDGE, W., "Flavion," Penn Road, Park Street, Nr. St Albans, Herts. *ent.*
- 1947 WILKINSON, W., 21, Highfield Avenue, Goldthorpe, Nr. Rotherham, Yorks. *l.*
- 1947 WILLIAMS, Mrs D. M., "Warley Lea," Brentwood, Essex. *l.*
- 1945 WILLIAMS, E. F., F.R.E.S., "Warley Lea," Brentwood, Essex. *l.*

## ELECTION.

- 1947 WILLIAMS, E. P., "Warley Lea," Brentwood, Essex. *l, od.*
- 1925 WILLIAMS, H. B., Q.C., LL.D., F.R.E.S., West Moushill, Milford,  
Nr. Godalming, Surrey. *l, g.*
- 1948 WILLIAMS, L. H., B.Sc., 31, Armour Road, Tilehurst, Reading,  
Berks. *ent.*
- 1932 WILLIAMS, S. W. C., 17, Beresford Road, Chingford, London,  
E.4. *l.*
- 1951 WOOD, E. F., 18, Nursery Road, Prestwich, near Manchester,  
Lancs. *l.*
- 1927 WORMS, C. G. M. DE, M.A., PH.D., F.R.I.C., F.R.E.S., M.B.O.U.,  
"Three Oaks", Shore's Road, Horsell, Woking, Surrey. *l, orn.*
- 1949 WRIGHTSON, A. L., 93, Morse Street, Lower Brunshaw, Burnley,  
Lancs. *l.*
- 1945 WYKES, N. G., Carter House, Eton College, Windsor, Berks. *l.*
- 1951 WYNN, R. A. W., 14, Nursery Avenue, Hale, near Altrincham.  
Cheshire. *ec. ent, hem.*
- 1945 YODEN, GEORGE H., F.R.E.S., 18, Castle Avenue, Dover, Kent. *l.*
- 1950 YOUNG, Miss G. M., 31, Turnfield Lane, London, N.8. *l.*
- 1952 YOUNG, L. D., 55, Ottways Lane, Ashted, Surrey. *ent.*

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Members will greatly oblige by informing the Hon. Secretary of any errors in, additions to, or alterations required in the above addresses and descriptions.

# Geographical List of Members arranged under Country, County and Town in Alphabetical Order

## ENGLAND.

### BEDS.

#### *Bedford.*

Smith, M. W. P

#### *Leighton Buzzard.*

Reid, J. F.

#### *Luton.*

Chandler, H. G.

### BERKS.

#### *Finchampstead.*

Hyde, R. A.

#### *Newbury.*

Saundby, R.

#### *Reading.*

Baker, B. R.

Dolton, H. L.

Easton, N. T.

Quinney, L. G.

Runge, C.

Williams, L. H.

#### *Wallingford.*

Newman, D. E.

#### *Windsor.*

Wykes, N. G.

#### *Woodley.*

Allen, P. V. M.

#### *Woolhampton.*

Smith, F. W.

#### *Bebington.*

Prichard, R.

#### *Bromborough.*

Snell, B. B.

#### *Caldy.*

Clarke, C. A.

#### *Chester.*

Smith, S. G.

#### *Nantwich.*

Boyes, J. D. C.

#### *Northwich.*

Crewdson, R. C. R.

#### *Stalybridge.*

Charlson, S.

#### *Wilmslow.*

Kloet, G. S.

### CORNWALL.

#### *Bude.*

Harbottle, A. H. H.

### CUMBERLAND.

#### *Brampton.*

Johnson, G. F.

#### *Carlisle.*

Day, F. H.

Mansbridge, W.

#### *Penrith.*

Hervey, G. A. K.

### DERBY.

#### *Derby.*

Atherly, Miss M.

#### *Ilkeston.*

Blasdale, P.

### DEVON.

#### *Ashburton.*

Stidston, S. T.

#### *Axminster.*

Bliss, A.

#### *Plymouth.*

Watkins, O. G.

#### *Newton Abbot.*

Coleridge, W. L.

#### *Sampford Peverell.*

Lyon, F. H.

#### *Torquay.*

Lees, F. H.

### DORSET.

#### *Broadmayne.*

Philpott, V. W.

#### *Dorchester.*

Lisney, A. A.

#### *Swanage.*

Russell, A. G. B.

### BUCKS.

#### *Aylesbury.*

Spittles, C. E.

#### *Bletchley.*

Kershaw, S. H.

Richardson, N. A.

#### *Great Missenden.*

Stedall, H. P. P.

#### *High Wycombe.*

Oliver, G. B.

Oliver, G. H. B.

#### *Newport Pagnell.*

Cripps, C. H.

### CAMBS.

#### *Cambridge.*

Rivers, C. F.

Storey, W. H.

#### *Wisbech.*

Elgood, W. S.

### CESHIRE.

#### *Altrincham.*

Wynn, R. A. W.

*West Parley*

King, H  
 Wimborne.  
 Harwood, P.

## DURHAM.

*Barnard Castle.*  
 Robson, J. P.  
*Gateshead.*  
 Montgomery, J. R. P.  
*Sunderland.*  
 Jefferson, T. W.

## ESSEX.

*Brentwood.*  
 Stanley-Smith, F.  
 Williams, D. M.  
 Williams, E. F.  
 Williams, E. P.  
*Colchester.*  
 Blaxill, A. D.  
 Ives, D. H.  
*Gidea Park.*  
 Rawlings, C. J.  
*Hutton.*  
 Friedlein, A. F. E.  
*Loughton.*  
 Lockington, N. A.  
 Payne, R. M.  
 Sutton, G. R.  
*Mistley.*  
 Rose, I. C.  
*Rayleigh.*  
 More, D.  
*Southminster.*  
 Dewick, A. J.  
*Stanford-le-Hope.*  
 Watts, W. J.  
*Waltham Abbey.*  
 Sculthorp, A. H.  
*Westcliff-on-Sea.*  
 Huggins, H. C.

## GLOS.

*Bourton-on-the-Water.*  
 Renfrew, C.  
*Bristol.*  
 Bell, C. L.  
 Hinton, H. E.  
 Watkins, N. A.  
*Minchinhampton.*  
 Richardson, A.  
*Quedgeley.*  
 Thorpe, J.  
*Stroud.*  
 Peacey, A. F.  
*Tetbury.*  
 Newton, J.

## HANTS.

*Alton.*  
 May, J. T.  
 Robinson, H. S.  
*Andover.*  
 Maxwell, R. M.  
*Basingstoke.*  
 Goodliffe, F. D.  
*Bishopstoke.*  
 Ray, H.  
*Bournemouth.*  
 Brown, S. C. S.  
 Curtis, W. P.  
 Fraser, F. C.  
 Murgatroyd, J. M.  
 Symes, H.  
 Turner, H. J.  
*Burley.*  
 Mackworth-Praed, C. W.  
*Chandlers-ford.*  
 Goater, B.  
*Christchurch.*  
 Andrews, H. W.  
 Barton, B. C.  
 Carr, F. M. B.  
*Eastleigh.*  
 Curl, B. J. A.  
 Holloway, P. H.  
*Fordingbridge.*  
 Burton, P. J.  
*Gosport.*  
 Burns, B. S.  
*Lee-on-Solent.*  
 Torlesse, A. D.  
*Lymington.*  
 Farwell, I. G.  
*Micheldever.*  
 Dixon, C. H.  
*Portsmouth.*  
 Langmaid, J. R.  
*Romsey.*  
 Ransome, A. L.  
 Sims, J. H.  
*Rowlands Castle.*  
 Stanley, F. C.  
*Southampton.*  
 Watson, R. W.  
*Warblington.*  
 Sperring, A. H.  
*Winchester.*  
 Blyth, S. F. P.  
 Fennell, D. W. H.

## HERTS.

*Arkley.*  
 Howarth, H.  
 Howarth, T. G.  
*Barnet.*  
 Calderara, P.

*Bishop's Stortford.*

Allan, P. B. M.  
Ashwell, D. A.  
Craufurd, C.  
Mellows, C.

*Broxbourne.*

Thorn, B. A.

*Harpenden.*

Jarvis, C. MacK.

*Kings Langley.*

Dunk, H. C.

*Letchworth.*

Bowden, S. R.

*Radlett.*

Howard, A. P.

*st Albans.*

Byers, F. W.  
Edwards, G. G.  
Janson, O. J.  
Wildridge, W.

*Tring.*

Cockayne, E. A  
Goodson, A. L

## HUNTS.

*Brampton.*

Quibell, W.

*Wood Walton.*

Leeds, H. A

## I. OF MAN.

*Santon.*

Hedges, A. V.

## I.O.W.

*Cowes, East.*

Saunt, J. W.

*Ryde.*

Lloyd, T. A.

## KENT.

*Ashford.*

Cue, P.  
Duffield, C. A. W.  
Rudland, W. L.  
Scott, E.

*Aylesford.*

Davis, G. A. N.

*Beckenham.*

Lane, A. W.

*Bexley.*

Ford, L. T.  
Newman, L. H.

*Borough Green.*

McDermott, C. A.

*Bromley.*

Cox, W. A. A.  
Jacobs, S. N. A.  
Jarvis, R. L.

*Canterbury.*

Parry, J. A.

*Dartford.*

Hare, E. J.  
Scudder, J. G. E.  
West, B. K.

*Dover.*

Youden, G. H.

*East Malling.*

Groves, J. R.  
Masse, A. M.

*Folkestone.*

Gilliat, F. T.  
Morley, A. M.  
Self, K. W.

*Gillingham.*

Wallis, J. L. P.

*Gravesend.*

Southwood, T. R. F.

*Herne Bay.*

Marsh, D. G.

*Kemsing.*

Roche, C. G.

*Maidstone.*

Grant, F. T.

*Meopham.*

Pounce, A. G.

*Orpington.*

Gowing-Scopes, E  
Line, H. V.  
Siggs, L. W.

*Petts Wood.*

Taylor, J. O.

*Ramsgate.*

Lanfear, A. H

*Sandhurst.*

Bull, G. V.

*Sevenoaks.*

Busbridge, W. E.

*Shortlands.*

Morris, M. G.

*Sidcup.*

Ling, R. B.  
Taylor, H. G. W.

*Tankerton.*

Atkinson, J. L.

*Tonbridge.*

Blest, T.

*Westerham.*

Edwards, R. C.

*West Wickham.*

Chalmers-Hunt, M.  
Owen, G. V.  
Trundell, E. E. J.

*Wilmington.*

Honeybourne, T. J.

## LANCS.

*Accrington.*

Thornton, J.

*Blackburn.*

Bryce, D.

*Bolton.*  
Coxey, S.  
*Burnley.*  
Wrightson, A. I.  
*Formby.*  
Davidson, A. R.  
Fraser, M. G.  
Leech, M. J.  
*Manchester.*  
Michaelis, H. N.  
Wood, E. F.  
*Nelson.*  
Brindle, A.  
Jopson, F. L.  
*Southport.*  
Greenwood, K. C.

## LEICESTERSHIRE.

*Leicester.*  
Murray, D. P.

## LINCS.

*Boston.*  
Bowser, E. W.  
Cooper, B. A.  
*Grantham.*  
Platts, J. H.  
*Grimsby.*  
Jeffs, G. A. T.  
*Market Rasen.*  
Court, T. H.  
*Skellingthorpe.*  
Small, H. M.

## LONDON.

E.4. *Chtingford.*  
Forster, H. W.  
Pinniger, E. B.  
Shaw, R. G.  
Weal, R. D.  
Williams, S. W. C.  
E.7. *Forest Gate.*  
Baxter, L. N.  
Baxter, R. N.  
E.11 *Wanstead.*  
Butterfield, A. W.  
Syms, E. E.  
N.2. *East Finchley.*  
Groves, J. R.  
N.6.  
West, B. B.  
N.8. *Hornsey.*  
Janson, O. J.  
Young, G. M.  
N.10. *Muswell Hill.*  
Chevallier, L. H. S.  
Eastmure, D. F.  
N.12. *Finchley.*  
Cross, G. S. E.

N.15. *S. Tottenham.*  
Brooke, W. M. A.  
N.19. *Holloway Road.*  
Buck, F. D.  
Knight, F.  
N.20. *Whetstone.*  
Lovell, R.  
N.W.1. *Regent's Park.*  
Hemming, A. F.  
Talbot de Malahide.  
N.W.3. *Hampstead.*  
Griffiths, G. C. D.  
Spencer, K. A.  
N.W.4. *Hendon.*  
Webb, H. E.  
N.W.6.  
Hillaby, J. D.  
N.W.7. *Mill Hill.*  
Ellis, D. J.  
N.W.8. *Regent's Park.*  
Bushby, L. C.  
Leston, D.  
N.W.9. *Kingsbury.*  
Ashby, G. J.  
Turner, A. D.  
S.E.3. *Blackheath.*  
Gould, A. W.  
S.E.5. *Ruskin Park.*  
Wakely, S.  
S.E.6. *Catford.*  
LeGros, A. E.  
Warrier, R. E.  
S.E.13. *Lewisham.*  
Whitehorn, K. P.  
S.E.18. *Plumstead.*  
Green, J. A.  
Hards, C. H.  
Popham, W. J.  
S.E.21. *Dulwich.*  
Edwards, T. G.  
S.E.25. *South Norwood.*  
Cornellus, J. A.  
Lewis, E.  
Nissen, C. I.  
S.W.1. *Westminster.*  
Collier, A. E.  
Frazer, J. F. D.  
Gordon, D. J.  
Harrison-Gray, M.  
Harvey, J. G.  
Prideaux, A. G.  
S.W.2. *Tulse Hill.*  
Hawgood, D. A.  
Newton, J. L.  
S.W.3. *Chelsea.*  
Cork, C. H.  
S.W.6. *Fulham.*  
Tams, W. H. T.

- S.W.7 *S. Kenston.*  
Cadbury, B.  
Evans, E.  
Richards, O. W
- S.W.13. *Barnes.*  
Hodgkinson, A.
- S.W.15. *Putney.*  
Phelps, C. C.  
Swain, H. D.
- S.W.16. *Streatham.*  
Daly, D. W.
- S.W.17. *Tooting.*  
Allen, D. M.
- S.W.18. *Wandsworth.*  
Hall, D. G.  
Michaud, J.
- W.1. *Mayfair.*  
Manley, W. B. L  
Stigant, B.
- W.2.  
Ball, P. A. J.  
Wiffen, R. C. G.
- W.5. *Ealing.*  
Hanson, S. M.
- W.6.  
Uffen, R. W. J.
- W.8.  
Craske, R. M.
- W.9.  
Peters, W.
- W.14. *W. Kenston.*  
Astbury, C. F.
- W.C.1.  
Demuth, R. P.  
Feilden, G. St. Clair.  
Janson, D. B.
- W.C.2.  
Pooles, S. W. P

## MIDDLESEX.

- Bedfont.*  
Kindred, A. D.
- Enfield.*  
Eagles, T. R.
- Feltham.*  
Classey, E. W.
- Harrow.*  
Martin, E. L.  
Riordan, B. D.
- Hayes.*  
Moppett, A. A
- Northwood.*  
Adams, R. W
- Pinner.*  
Minnion, W. E.  
Saunders, J. M. K.
- Stanmore.*  
Harris, W. H. A.

- Hilliard, R. D.  
Lorimer, R. I  
McCrae, A. W. R  
*Teddington.*  
Ferguson, L. F.  
*Twickenham.*  
Stallwood, B. R

## NORTHANTS.

- Roads.*  
Humphrey, S. W.  
*Wellingborough.*  
Gent, P. J.  
Payne, J. H.

## OXFORD.

- Oxford.*  
Bailey, K. E. J.  
Ford, E. B.  
Kettlewell, H. B. D.  
Varley, G. C.

## SOMERSET.

- Banwell.*  
Cousins, R. J.
- Bath.*  
Kemp, J. K. C.  
*Burnham-on-Sea.*  
Herring, J. F.  
Heslop, E. A.  
Heslop, I. R. P.
- Frome.*  
Cruttwell, G. H. W.
- Misterton.*  
Lipscomb, C. G
- Taunton.*  
Turner, A. H.
- Wells.*  
Thompson, J. A.  
Valentine, A.
- Weston-super-Mare.*  
Blathwayt, C. S. H

## SUFFOLK.

- Ipswich.*  
Beaufoy, S.  
White, E. M. S.

## SURREY.

- Ashted.*  
Brush, H. J.  
May, R. M.  
Young, L. D.
- Banstead.*  
Gardner, A. E.  
Last, H. R.  
Perry, K. M. P.  
Rumsey, F.



- Bletchingley.*  
 Hickin, N. E.  
*Bookham, Great.*  
 Collins, R. J.  
*Camberley.*  
 Parfitt, R. W.  
*Carshalton Beeches.*  
 Thorpe-Young, D. W.  
 Thorpe-Young, M.  
*Cheam.*  
 Baker, D. B.  
 Struthers, F. M.  
*Chiddingfold.*  
 Mere, R. M.  
*Chipstead.*  
 Bolton, E. L.  
*Chobham.*  
 Quarrington, C. A.  
*Claygate.*  
 Perkins, J. F.  
*Cobham.*  
 Purefoy, J. B.  
*Coulsdon.*  
 Denvil, H. G.  
 Ferrier, W. J.  
*Coulsdon (Old).*  
 Britten, H.  
*Cranleigh.*  
 Russell, S. G. C.  
*Dorking.*  
 Atty, D. B.  
 Carter, R. A.  
 Cole, G. A.  
 Haynes, R. F.  
 Howard, J. O. T.  
*Epsom.*  
 Robinson, B. H. B.  
 Vallins, F. T.  
*Esher.*  
 Brett, G. A.  
 Craske, J. C. B.  
 Ennis, L. H.  
 Short, H. G.  
*Ewell.*  
 Tunstall, H. G.  
*Ewell (East).*  
 Lang, R. M.  
 Wells, H. O.  
*Farnham.*  
 Moore, B. P.  
*Godalming.*  
 Goodban, B. S.  
 Stanners, L. S.  
 Williams, H. B.  
*Guildford.*  
 Garland, W. A.  
 Holroyd, G. C.  
*Haslemere.*  
 Baker, J. A.  
*Hawley.*  
 Richards, A. W.  
*Hersham.*  
 Moore, D. R.  
*Horsley (East).*  
 Crow, P. N.  
*Kingswood.*  
 Coxon, G. F.  
*Leatherhead.*  
 Watson, D.  
*Leigh.*  
 Fairclough, R.  
*Merton Park.*  
 Coulson, F. J.  
*Morden.*  
 August, V. E.  
 Field, J. C.  
 Ollevant, D.  
*New Malden.*  
 Spreadbury, W. H.  
*Ottershaw.*  
 Bretherton, R. F.  
 Parsons, R. E. R.  
*Pirbright.*  
 Lawson, H. B.  
*Purley.*  
 Doudney, S. P.  
 Ellis, J. E.  
 Henderson, J. L.  
 MacNulty, B. J.  
 Walker, D. H.  
*Redhill.*  
 Rait-Smith, W.  
*Reigate.*  
 Petersen, K.  
 Ryle, G. B.  
*Richmond.*  
 Whicher, L. S.  
*Sanderstead.*  
 Russwurm, A. D. A.  
*Selsdon.*  
 Foster, T. B.  
 Wild, E. H.  
*Stoneleigh.*  
 Hutchings, H. R.  
 Thornton, R.  
*Surbiton.*  
 Wainwright, J. C.  
*Sutton.*  
 Bolingbroke & St. John.  
 Currie, P. W. E.  
 Danby, G. C.  
 Frohawk, M. J.  
 Summers, E. J.  
 Turner, J. F.  
*Tadworth.*  
 Wheeler, A. S.  
*Thornton Heath.*  
 Parmenter, L.

*Waddon.*

Prevett, P. F.

*Wallington.*

Brown, F. C.

Christie, J.

Christie, L.

Niblett, M.

Owers, D. E.

*Weybridge.*

Best, A. A.

Lethbridge, Mrs. M. J.

Messenger, J. L.

*Wimbledon.*

Bradley, J. D.

Hawkins, C. N.

Riley, N. D.

Tubbs, M.

Tubbs, R. S.

Wakely, L. D.

*Woking.*

Stoughton-Harris, G.

Worms, C. G. M. de.

*Worcester Park.*

Hyde-Wyatt, B.

Richardson, A. E.

Stafford, A. E.

## SUSSEX.

*Arundel.*

Haggett, G. M.

*Buldinghurst.*

Curtis, A. E.

*Bognor Regis.*

Jarvis, F. V. L.

*Brighton.*

Banner, J. V.

Dyson, R. C.

*Chailey (South).*

Odd, D. A.

*Chichester.*

Boyce, B.

*Chiddingly.*

Humphrey, J. C.

*Crawley.*

Gibbins, M. J.

*Eastbourne.*

Ellison, E. F. D.

Ellison, R. E.

Marcon, J. N.

Smith, D. S.

Wallis-Norton, S. G.

*Ferring-by-Sea.*

Menzies, I. S.

*Horam.*

Hitchins, P. E. N.

*Horsted Keynes.*

Hoare-Ward, J. W.

*Littlehampton.*

Jay, E. P.

*Newick.*

Embry, B.

*Pulborough.*

Manley, G. E. L.

Robertson, G. S.

*Ringmer.*

Gully, J. G.

*Wisborough Green.*

McClure, A. M.

*Worthing.*

Edwards, F. H.

## WARWICK.

*Birmingham.*

Bowater, W.

Evans, L. J.

Hammond, H. E.

Manly, G. B.

Siviter Smith, P.

Timms, C.

Wakeman, C. M.

*Olton.*

Wainwright, C.

*Solihull.*

Allen, D.

Carlier, S. E. W.

Price, G. C.

## WESTMORLAND.

*Kendal.*

Birkett, N. L.

## WILTS.

*Ramsbury.*

Fraser, R. A.

*Salisbury.*

Howell, P. R.

Temple, V.

*Swindon.*

Hulls, L. G.

*Tilshead.*

Gilman, H. C. R.

*Trowbridge.*

Weddell, B. W.

*Warmminster.*

Jackson, R. A.

## WORCESTERSHIRE.

*Evesham.*

Burton, R. J.

*Redditch.*

Latham, F. H.

## YORKS.

*Doncaster.*

Hyde, G. E.

*Hull.*

Wade, D.

*Leeds.*

Taylor, A. S.

*Rotherham.*  
 Wilkinson, W.  
*Sheffield.*  
 Reid, W

*Shipley.*  
 Hewson, F  
*York.*  
 Smith, A.

## IRELAND.

CO. DUBLIN.  
*Glenageary.*  
 Baynes, E. S. A.

## SCOTLAND.

ABERDEEN.  
*Aberdeen.*  
 Morison, G. D.  
  
 DUMFRIES-SHIRE.  
*Collin.*  
 Balfour-Browne, W. A. F.  
*Dumfries.*  
 Cunningham, D.

INVERNESS-SHIRE.  
*Newtonmore.*  
 Harper, G. W.

MIDLOTHIAN.  
*Edinburgh.*  
 Dunbar, J. G.  
 Macnicol, D. A. B.  
 Pelham-Clinton, E. C.

## WALES.

DENBIGH.  
*Wrexham.*  
 Eckford, E.

GLAMORGAN.  
*Port Talbot.*  
 Morgan, H. D.

## ABROAD.

EUROPE.  
*Austria.*  
 Klimesch, J.  
*Czechoslovakia.*  
 Polacek, V. B.  
*Denmark.*  
 Carolsfeld-Krause, A. G.  
 Olsen, E. T.  
*France.*  
 Herbulot, C.  
 Kummerer-Naegele, H.  
 Viette, P. E. L.  
*Italy.*  
 Storace, L.  
*Netherlands.*  
 Playford, F. L.  
*Sweden.*  
 Torstenius, S.

AFRICA.  
*Cape Province.*  
 Taylor, J. S.  
*Kenya.*  
 Hollebone, L. H. T.  
*Nigeria.*  
 Roche, P. J. L.  
*Tanganyika.*  
 Dudbridge, B. J.  
*Uganda.*  
 Sevastopulo, D. G.

AMERICA.  
*Argentina.*  
 Hayward, K. J.  
*Canada.*  
 Beirne, B. P.  
*Connecticut.*  
 Gifford, W. S.  
*Washington, D.C.*  
 Hall, S. S.

ASIA.  
*Hong Kong.*  
 Burkhardt, V. R.  
*India.*  
 Wakely, L. J. D.  
*Japan.*  
 Asahina, S.  
*Jordan, Kingdom of.*  
 Trought, Trevor.  
*Mulaya.*  
 Stubbs, G. C.  
 Tweedie, M. W. F.

AUSTRALIA.  
*New South Wales.*  
 O'Farrell, A. F.  
*Tasmania.*  
 Couchman, L. E.

## COUNCIL'S REPORT for 1953-54

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Before an increase in subscription rates is put into operation, its anticipated effect is always somewhat speculative, and it was inevitable, therefore, that the events of the past year should be watched by your Council with interest, if not a little anxiety. It is consequently with great pleasure that another satisfactory year of progress can be reported. With the increase in subscription rates, the expected resignations duly arrived, but only the moderate number of 27 was received during the year. This loss was more than countered by the intake of new members, and on the 31st December last the total membership stood at 515, which represents a nett increase of 2 members over the membership at the same time last year. Our strength of 515 is made up of 3 Honorary, 5 Special Life, 14 Life, 254 Ordinary and 239 Country Members. There have been four deaths, which will be mentioned in more detail by your President, and 5 members were struck off for non-payment of subscriptions. 38 new members were elected and completed their obligations.

Mr. E. J. Hare, having joined the Society in 1902 and thus completed 50 years of membership, has now been appointed a Special Life Member, and Mr. H. W. Andrews, who joined in 1907 and held the Presidential chair in 1929, has been elected an Honorary Member by your Council in recognition of his long association with and service to the Society.

The usual 21 Ordinary meetings were held, two of them taking place in the Meeting Room of the Linnean Society of London, as the rooms of the Royal Society were not available on those occasions. Meetings continue to be well attended, the average attendance throughout the year being 57. At two meetings we had the privilege of enjoying the superb colour photography of Mr. C. P. Rose. Our thanks are due to him for the pleasure he has given us and his interest in the Society. Distinguished visitors included Dr. Asahina of Tokyo, since enrolled as a member, Professor and Mrs. Alexander B. Klots from New York, Professor Robert L. Usinger from California, Herr Wagner from Mainz, Germany, and Professor Teiso Esaki from Japan.

During the year, 23 Field Meetings were held and were generally well attended. The two most ambitious meetings were those to the Isle of Wight and the Warren, Folkestone. These particular expeditions had been very popular some years ago, and it was pleasant to see them revived and once more on the programme. Excursions of this nature involve much work on the part of the organisers, and we are grateful to them for their industry on our behalf. On the Island *Melitaea cinxia* L. was found to be common in its well-known haunts, and it was gratifying to discover that *Aplasta ononaria* Fuessl. was easily holding its own in the Warren. On three occasions, the parties attending the meetings were entertained to tea by the wives of the

leaders in their homes. These ladies were Mrs. Rumsey at Banstead, Mrs. Mere at Chiddingfold and Mrs. Odd at Chailey, and we extend to them our warmest thanks for their courtesy and charming hospitality.

Another very enjoyable Annual Dinner was held at the Holborn Restaurant and was attended by 95 members and guests. The Amateur Entomologists' Society was the guest society and was represented by its President, Mr. L. W. Siggs, the Honorary Treasurer, Mr. P. C. Le Masurier, and the Honorary Secretary, Mr. E. Lewis. Other guests were Major A. Greig, Assistant Secretary to the Geological Society of London, Professor G. C. Varley, the Hope Professor, Mr. E. B. Britton, Honorary Secretary to the Royal Entomological Society of London, and Mrs. Britton. Once more we had the pleasure of welcoming the officers of the Royal Society, Dr. Martin and Mr. Kaye, and, as Mr. Rogers had retired, we were very pleased to have with us his successor, Mr. W. M. Malcolm. As it was believed that many members who are only able to join our gatherings on such occasions would like a pictorial record of the event, a firm of photographers was engaged.

The Exhibition on the following day was the usual great success, and we are again grateful to the Royal Society and the Geological Society of London for allowing us to use their libraries for the occasion. The Attendance Register was signed by 228 members and 145 visitors, which is well up to the average for the past few years. Neuroptera and Orthoptera were the Orders for special consideration, and students of these Orders are to be congratulated on the excellence of their exhibits. There was a particularly comprehensive display of the Odonata. The exhibits of Lepidoptera were, perhaps, not quite up to the usual standard, but this was doubtless due to a rather poor year for insects generally. These conditions existed also in other parts of Europe. A specimen of *Nymphalis xanthomelas* Esper, taken in Kent, excited great interest, this being the first record in England of this imposing Central and Eastern European butterfly. Mr. Norman C. Pilleau, who is not a member, very kindly loaned his extensive collection of *Aphantopus hyperantus* L., the result of over 15 years patiently observing this species. Owing to pressure of work, the Pest Infestation Division of the Ministry of Agriculture and Fisheries was unable to bring so large an exhibit as usual, but Mr. L. C. Bushby brought from the Zoo an interesting selection of its more curious or rare insects, spiders, scorpions, batrachians and reptiles. Mr. Tams, as usual, sacrificed much time carefully selecting and photographing specimens for illustrating the Proceedings, and we once more offer him our thanks for his services.

An important development in the activities of the Society is the arrangement with the Nature Conservancy to invite our members to assist in carrying out an entomological survey of the sites in which the Conservancy is interested. Circulars have been sent to all members, and the response has been sufficient to justify the decision, which your Council had taken, to proceed with the project for a trial period of one year. At the present time, members may not have received instructions regarding sites in their neighbourhood, but this work of

allocation is well in hand. It is believed by your Council that participation in this scheme will add great interest to our entomological pursuits, and members who live far from London will be conscious of taking a far more active part in the affairs of the Society. Many members have already expressed willingness to collect insects of Orders which they do not normally study, and it is hoped to assist and encourage them by having the specimens identified by specialists in those Orders. As the work will entail the recording of the common species as well as the rarities, an important result should be the widening of our knowledge of the distribution in the British Isles of many species often ignored because of their frequency. There should also be opportunities for ecological work by those members with the requisite ability and inclination. It is hoped that at this time next year it will be possible to give a satisfactory account of work accomplished.

Your Council very much regrets having to inform you that it is still unable to mention a probable date for the publication of the "Proceedings and Transactions" for the year 1952/53. The cause of the delay is quite beyond their control. Most members will know that the awaited volume included two important papers on the British Micro-lepidoptera, one on the Glyphipterigidae, by Mr. L. T. Ford, and the other on the Lyonetiidae, by Mr. S. C. S. Brown. These papers are illustrated by coloured plates executed by Mr. S. N. A. Jacobs and Col. F. C. Fraser respectively. The plates have only recently been completed by the printers. Members are assured that everything reasonable is being done to expedite the issue of this volume. It will include a complete list of members.

For some years it had been obvious that the restricted library space available to the Society was totally inadequate to hold the growing number of volumes. Drastic action was necessary. With the authority of your Council, the librarian has combed the book-cases and cupboards for books which could be discarded because of their slight utility to the Society. A considerable number of bound books, separates and series of periodicals were selected for disposal, and these have since been sold, after approval by the Council and Trustees. In this way, much space has been found for new acquisitions, and the accessibility of books has been considerably improved.

The Honorary Curator reports that during the past year additions to the Society's collections have been made by Messrs. F. T. Vallins, A. E. Gardner, H. E. Webb, F. J. Coulson, S. Torstenius, and Trevor Trought (Lepidoptera), W. H. Spreadbury, V. E. August and F. T. Vallins (Coleoptera), A. E. Gardner (Orthoptera), W. H. Sperring and V. E. August (Hymenoptera), H. G. Tunstall (Diptera), D. Leston, F. J. Coulson and Dr. A. M. Masee (Heteroptera). The best thanks of the Society are due to these members. A re-arrangement of the Orthoptera by Mr. A. E. Gardner has been carried out and the re-arranging of the Syrphidae (Diptera) is in hand. Eleven drawers of the Palaearctic Lycaenid collection have now been completed.

The Librarian reports it is hoped to clear up arrears of binding during the next few months. Members' attention is drawn to the suggestions book—suggestions for the purchase of library books may be entered there.

A list of additions to the library during 1953 follows:—

By gift:—Royal Ent. Soc. Lond., *Transactions and Proceedings* of that society, 1953.

By Purchase or Exchange:—Entomologist; Entomologist's Monthly Magazine; Entomologist's Gazette; Entomologist's Record; Canadian Entomologist; Entomological News; Tydschrift voor Entomologica; Opuscula Entomologica; Zoologiska Bidrag; Mitteilungen; Beitrage Zur Entomologie; Lloydia; Wisconsin Academy of Science, Trans.; Fieldiana, Zoology; Bulletin, Societe Entomologique de Belgique; Essex Naturalist; London Naturalist and Bird Report; Proc. I.O.W. Nat. His. Soc.; Lincolnshire Nat. Union; Norfolk and Norwich Nat. Soc. Trans.; Natural History, New York; Smithsonian Institute Reports.

## TREASURER'S REPORT, for 1953

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Members will expect a good report from me on this occasion, the increased rates of subscription having come into force, and the Grant-in-Aid of Publications received through the Royal Society having been brought forward from the previous year. I think the audited Accounts I am about to read will be considered satisfactory.

### CAPITAL ACCOUNT.

This fund has been augmented by selling, with our Trustees' approval, two pieces of furniture and a number of books and papers which were not required, the sum realised being £97 15s.

### BALANCE SHEET.

The market value of our investments at the end of the year was £1,245, an appreciation of almost £100 in the twelve months. The cash position is also stronger by approximately £300. The large amount shown as cash in hand was occasioned by my receiving cheques for £85 after banking hours on the last day of the year.

### INCOME AND EXPENDITURE.

While other expenses were almost identical with 1952, the cost of postages and the stationery used by the Secretary and myself shows a saving of some £38, largely by more use being made of the duplicator. Subscriptions received amount to £595 13s 6d. It will be noticed that this item has not exceeded by one half the amount received in the previous year, as it should. The reason is obvious, more members having failed to pay before the year ended. We have, however, kept well within our income, for after deducting a grant of £300 to the Publication Fund there is a balance of £179 18s 1d to carry forward.

### PUBLICATION FUND.

The cost of producing the "Proceedings and Transactions", copies of which we hope to see soon, will amount to £404, nearly £100 more than the last issue. But there will be two very fine coloured plates of "Micros". To pay for all this we have the Parliamentary grant-in-aid and the £300 from Income already mentioned, together with the proceeds of sales of publications, store boxes, etc., investment interest and donations. I would like to renew my thanks to those who generously provided the last item, in particular Mr. E. W. Classey for his contribution of blocks for the illustration of his Address.

Our thanks are also due to the honorary auditors who have acted for so many times it seems unnecessary for me to mention their names.





# INCOME AND EXPENDITURE ACCOUNT—Year ended 31st December 1953.

Rent of Rooms ... ..	£72 6 0	Subscriptions (Arrears and Current) ... ..	£595 13 6
Insurance ... ..	2 8 0	Interest—	
Cleaning and Gratuities ... ..	4 10 0	£591 15s 3d 3½% Conversion Stock ...	£20 14 2
Secretarial Expenses ... ..	44 9 6	£100 0s 0d 3% Defence Bonds ...	3 0 0
Treasurer's Expenses ... ..	14 6 9	£600 0s 0d 2½% Consolidated Stock ...	15 0 0
		Deposit Interest ... ..	2 13 10
Subscriptions to Wicken Fen Fund, Footpaths Preservation Society, Ramblers' Association, National Trust, Protection Fund of the Royal Entomological Society, Council for the Pro- motion of Field Studies and Conservators of Oxshott Heath ... ..	£138 0 3	Annual Dinner Account—Surplus ... ..	41 8 0
Annual Exhibition Expenses ... ..	9 9 0		1 8 4
Field Meetings Expenses ... ..	10 9 0		
Grant to Publication Fund ... ..	0 13 6		
Balance being Excess of Income over Expenditure, carried to Balance Sheet ... ..	300 0 0		
	179 18 1		
	<u>£638 9 10</u>		<u>£638 9 10</u>

## CAPITAL ACCOUNT—Year ended 31st December 1953.

Transfer to Library Fund ... ..	£13 17 6	Balance at 1st January 1953 ... ..	£1,278 5 0
Balance at 31st December 1953 ... ..	1,376 0 0	Proceeds of Sale of Bookcase ... ..	£5 0 0
		Proceeds of Sale of Insect Cabinet ... ..	12 15 0
		Proceeds of Sale of Surplus Books, Magazines and Separates ... ..	80 0 0
		Entrance Fees ... ..	97 15 0
			13 17 6
	<u>£1,389 17 6</u>		<u>£1,389 17 6</u>

# LIBRARY FUND—Year ended 31st December 1953.

Purchases—Books, etc.,	...	£2 5 0	Balance at 1st January 1953	...	£85 16 5
Binding	...	4 4 0	Entrance Fees	...	13 17 6
Balance at 31st December 1953	...	£6 9 0			
		93 4 11			
		£99 13 11			

# PUBLICATION FUND—Year ended 31st December 1953.

Stock on Hand, 1st January 1953	...	£130 0 0	Balance at 1st January 1953	...	£141 0 4
Printing and Posting the	...	...	Sales of "Proceedings"	...	6 3 9
ings and Transactions	...	£275 0 0	Sales of Store-boxes, Cartons, etc.	...	1 16 6
Blocks and Printing—	...	140 0 0	Interest, £300 0s 0d 3½% War Stock (Misses E. F.	...	10 10 0
The Coloured Plates	...	19 0 4	and L. M. Chapman)	...	8 5 0
The other Plates	...	404 0 4	Donations	...	4 12 3
Balance at 31st December 1953	...	3 7 6	Sales of "A Guide to the Smaller British Lepi-	...	300 0 0
			doptera"	...	65 0 0
			Grant from Income and Expenditure Account	...	
			Stock on Hand, 31st December 1953	...	£537 7 10

# ABSTRACT OF PROCEEDINGS

## INDOOR MEETINGS.

11th FEBRUARY 1953.

The PRESIDENT in the Chair.

### EXHIBITS.

Mr. D. LESTON—Male, female and nymph of *Phloeophana longirostris* Spin. (Hemiptera, Phloeidae), a bug which closely resembles lichen, from Brazil. He read the following note: "This group was raised to family status by China in 1933 (*Ann. Mag. nat. Hist.*, (10), 12: 180-196) but without stating the reasons for this step. I have now examined certain key structures. The trichobothria are Pentatomoid but arranged one behind the other instead of side-by-side. The 8th segment in males is complete with sternum and tergum and carries a pair of functional spiracles complete with musculature and trachea. The dorsal abdominal glands comprise three pairs, the first two separate and the last fused. The wing venation is typically Pentatomoid but R + M and Cu are not parallel and Cu bears a hamus. The aedeagus appears to be unique and will be described elsewhere. The spiracles of sternum II are shielded but not closed by the metapleurites. Thus one concludes that the group is a true family; correctly placed in Pentatomoidea; it retains many primitive characters; its nearest living relations are found in the Tessaratominae. Finally, the correct author is Dallas, 1851."

Mr. T. R. EAGLES—Fruiting specimens of the moss *Bryum capillare* Hedw. from Herts.

### COMMUNICATIONS.

Mr. N. G. WYKES read a paper, illustrated by the lantern, "The Technique of Entomological Drawing in Water-colours." (See *Trans.*)

25th FEBRUARY 1953.

The PRESIDENT in the Chair.

The deaths of Mr. C. G. Priest and Mr. E. D. Bostock were announced.

The Treasurer announced that he had sent to the Lord Mayor of London's National Flood and Tempest Distress Fund a donation of £6 2s. collected at the last Meeting.

### EXHIBITS.

BARON DE WORMS—The following moths—(1) *Discestra trifolii* Hufn., a very dark example from Woking, Surrey, August 1952. (2) *Heliothis dipsacea* L., a heavily banded specimen from the same locality. The species had not previously been recorded from the district. (3) *Cosmia*

*trapezina* L., a very pale specimen almost lacking markings from the same locality. (4) *Agrotis vestigialis* Hufn., an unusually grey example from the New Forest, Hants., August 1952.

Mr. A. H. SPERAING—Two species of the Lepidopterous genus *Lupeirina* Bdv., namely *nickerlii* Frey. and *testacea* Schiff. Members expressed different opinions about the correct name of the former insect. Moths from St. Anne's, Lancs., had been named *gueneei* by H. Doubleday.

Mr. B. K. WEST—Aberration of the Butterfly *Colias hyale* L. with discal spot and marginal border of fore-wings joined, and with bright orange suffusion on hind wings. It was a ♂ taken at Langen am Arlberg, Austria, 18th August, 1952.

#### COMMUNICATIONS.

A letter from Mr. H. A. Leeds was read, in which he said that Mr. H. Neaverson, the owner of Monks' Wood, Hunts., who had been so kind in giving naturalists permission to visit the wood, had died on 14th May, 1952. His ashes were scattered in the wood. Mr. Leeds informed The Nature Conservancy that the property was for sale and he had recently learned that that body had purchased nearly the whole of it, consisting of approximately 380 acres of Monks' Wood proper. Only the comparatively small West Wood, consisting of rather over ten acres on the east side of Monks' Wood and separated from it by a hedge and narrow drain, and the bungalow with about an acre in the corner opposite to Bevil's Wood have not been included in the sale, which does include the two cleared and cultivated areas of about 14 acres each situated in part of the north side of the main riding. For an account of the wood see *Proc. S. Lond. ent. nat. Hist. Soc.*, 1944-45: 75.

The season seemed to be an early one, judging by the Lepidoptera, *Achlya flavicornis* L. and *Gonepteryx rhamni* L.

Mr. C. P. ROSE exhibited and gave a commentary on coloured films he had made of birds on the Farne Islands, on the Bass Rock and at Havergate.

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11th MARCH 1953.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. H. E. WEBB—Ova of *Endromis versicolora* L. (Lep., Endromididae) on twigs of birch. These were canary yellow at first but soon turned red. The female walked down the twig laying a row of eggs and then up again laying a parallel row. By twisting her abdomen she laid the eggs on the side of the twig opposite to that on which she was walking.

Mr. D. LESTON—British and foreign examples of Acanthosomidae (Hem., Pentatomoidea). He stated that this group, containing five British species and some 55 genera throughout the world, should be raised to family status on the following characters: two-segmented

tarsi, the visible 8th male abdominal segment, the open pygophore, the unique aedeagus, presence of Pendergrast's organs on the female abdomen, length of the 1st antennal segment, presence of a spot at the apex of the stink-gland furrow in many species and other characters to be described in detail later. Dr. Dupuis (Paris) agrees with these conclusions.

#### COMMUNICATIONS.

Mr. W. B. BROUGHTON gave a talk, with lantern illustrations and sound reproduction, on the song of *Chorthippus bicolor* Charp. and other grasshoppers.

25th MARCH 1953.

The PRESIDENT in the Chair.

Members stood in tribute to the memory of Her Majesty Queen Mary.

#### EXHIBITS.

BARON DE WORMS on behalf of Mr. A. M. MORLEY—A specimen of *Ancylolomia tentaculella* Hb. (Lep., Crambidae) taken at Dungeness, Kent, on 26th July 1935, the earliest British record of this Pyrale. It remained undetected in the collection of Mr. Morley until this year when his attention was drawn to the reproduction of a specimen of this species taken by Mr. S. Wakely at Dymchurch in 1952 and described in *Ent. Rec.*, 64: 273. Mr. E. L. Martin of the British Museum (Natural History) kindly identified the specimen. The genus does not appear to have been noted before in England, though this species and several others have been recorded from the South of France. Also exhibited for comparison were two examples of *Ancylolomia palpella* Schiff., a very similar Pyrale obtained by Mr. Morley in Palestine. Though the wing patterns are very similar, the antennae in the male of the latter species are heavily pectinated. This insect also occurs in the South of France.

Dr. B. P. MOORE—A number of cases of Canadian insects, in connection with his talk; and some living larvae of the Cardinal Beetle, *Pyrochroa coccinea* L. (Coleoptera, Pyrochroidae), from Farnham, Surrey.

Mr. K. A. SPENCER—Scarabaeid beetles, *Oxythyrea funesta* Poda, from near Lisbon, Portugal.

Mr. B. K. WEST—An aberration of *Colias hyale* L. (Lep., Pieridae) showing the underside. The specimen, taken at Langen am Arlberg, Austria, 18th August 1952, was exhibited on 25th February when the upperside was shown. On the underside, the fore wings have a broad black band extending from the discal spot to the submarginal row of spots, while the hind wings, except the outer margin, are reddish-purple instead of yellow.

#### COMMUNICATIONS.

Dr. B. P. MOORE gave a talk, illustrated by the lantern, on "A Season in Eastern Canada".

8th APRIL 1953.

The PRESIDENT in the Chair.

The death of Major Noel Thomas was announced.

#### EXHIBITS.

Mr. F. D. BUCK—A case of specimens of British Heteromera (Coleoptera) to illustrate the families.

Mr. D. THORPE-YOUNG—A small collection of *Parasemia plantaginis* L. (Lep., Arctiidae) found in the Hardknott and Wrynose Pass area of Cumberland in 1936. Also examples of *ab. hospita* Schiff. mostly found in the Shetland Isles.

Mr. S. N. A. JACOBS—Water colour drawings of British Pyralidae and Plume Moths.

Mr. V. E. AUGUST—The Ichneumonid *Ophion luteus* L. from the Isle of Sheppey, Kent, 4th April 1953.

Mr. F. J. COULSON—Coleoptera of the genus *Cryptophagus* in the Society's collection. These had been re-arranged according to the modern classification. He read notes.

Mr. T. R. EAGLES—An early Victorian Presentation book, "The Night-Flyers—A series of Moth-Pictures", published by Paul Jerrard of London.

#### COMMUNICATION.

Mr. F. D. BUCK read a paper, illustrated by numerous drawings shown by the epidiascope, "Some remarks on the British Heteromera (Coleoptera)". (See *Trans.*)

22nd APRIL 1953.

The PRESIDENT in the Chair.

Mrs. Betty Cadbury and Messrs. A. W. Butterfield, J. G. Harvey and R. A. Hyde were declared elected members.

The death of Dr. N. H. Joy was announced.

#### EXHIBITS.

Mr. H. D. SWAIN—Living larvae of *Melitaea cinxia* L. (Lep., Nymphalidae) collected in the Isle of Wight, 21st April 1953.

Mr. L. H. PREVETT—Living specimens of the following beetles:—*Blaps mucronata* Latr. (Col., Tenebrionidae) from Tulse Hill, London, S.E.27, and *Xestobium rufovillosum* Deg. (Col., Anobiidae) from Alfriston, Sussex.

Mr. T. R. E. SOUTHWOOD—Living specimens of the following Heteroptera collected in the grounds of Rothamsted Experimental Station, Harpenden, Herts., on 21st April:—*Sehirus bicolor* L. (Cydnidae), *Stollia fabricii* Kirk. (Pentatomidae), *Berytinus minor* H.-S. (Neididae), *Tingis ampliata* H.-S. (Tingidae), *Ischnodemus sabuleti* Fallen, *Drymus sylvaticus* Fab., *Scolopostethus affinis* Sch. (Lygaeidae), *Nabis ferus* L., *Nabis rugosus* L. (Nabidae), *Anthocoris nemorum* L. (Anthocoridae) and *Liocoris tripustulatus* Fab. (Miridae).

Mr. S. TORSTENIUS—A larval case of the beetle *Cryptocephalus parvulus* Muell. (Col., Chrysomelidae) found on birch at Cobham, Surrey.

Mr. T. J. HONEYBOURNE—Live larvae of 5 of the British Fritillaries:—*Argynnis paphia* L., *A. aglaia* Rott., *Euphydryas aurinia* Rott., *Melitaea cinxia* L. and *M. athalia* Rott.

Mr. S. WAKELY—Living imagines of *Parasemia plantaginis* L. ab. *hospita* Schiff. (Lep., Arctiidae) reared from females collected in N. Yorks.

Mr. D. LESTON—Larvae of a species of *Eristalis* (Dipt., Syrphidae) found in water in a tree hole.

Mr. L. W. SIGGS—Larvae in 3rd and 4th instar of *Eacles magnifica* Walker (Lep., Sissisphingidae) from South America.

Mr. R. F. HAYNES—Larvae in various stages of growth of *Euphydryas aurinia* Rott. (Lep., Nymphalidae) from Hod Hill, Dorset.

Mr. F. RUMSEY—Larvae of the following Lepidoptera:—*Parasemia plantaginis* L., *Panaxia dominula* L., *Parascotia fuliginaria* L. and *Philudoria potatoria*.

Miss C. A. McDERMOTT—Larvae of *Lysandra coridon* Poda (Lep., Lycaenidae) from Somerset.

Mr. T. R. EAGLES—Two species of filmy fern from Co. Kerry, Ireland:—*Hymenophyllum tunbrigense* (L.) Sm. and *H. wilsoni* Hook.

Mr. W. H. SPREADBURY—The Discomycete fungus *Morchella rotunda* (Pers.) Boud. from Surrey.

Mr. F. T. VALLINS on behalf of Mr. J. P. ROBSON—*Oporinia dilutata* Schiff. ab. *latifasciata* Prout (Lep., Hydrimenidae), a series which he was presenting to the Society.

#### COMMUNICATIONS.

*Nymphalis polychloros* L. (Lep., Nymphalidae) had been seen in Barnsthorpe Wood, Surrey, on 18th April. A blackbird had nested in the swan neck of a drain pipe at Wimbledon, Surrey, and a Mistle-Thrush's nest had been found only three feet from the ground.

13th MAY 1953.

The PRESIDENT in the Chair.

Messrs. A. Hodgkinson, A.R.C.A.; M. G. Morris; P. F. Prevett and C. G. Roche were declared elected members.

#### EXHIBITS.

Mr. S. WAKELY—The beetle *Orchesia undulata* Kraatz (Col., Melandryidae) found on fungus at Effingham, Surrey, 2nd May 1953, and the Hemipteron *Gonocerus acuteangulatus* Goeze (Hem., Coreidae) from Ranmore, Surrey, 26th April 1953.

Mr. V. E. AUGUST—The orchid *Ophrys sphegodes* Mill. from Chalk, East Kent. He reported seeing a pure white example of *Orchis mascula* L.

BARON DE WORMS—Larvae of the following Lepidoptera:—*Gypsites leucographa* Schiff. from Witherslack, Westmorland, and *Jodia croceago* Schiff. from Ham Street, Kent.



Mr. S. N. A. JACOBS—Two further sets of water-colour drawings of British Pyralid and Plume Moths.

Mr. F. D. BUCK—A short series of the weevil *Orobitis cyaneus* L. (Col., Curculionidae) taken at the roots of violets growing in the moss on the slopes of Boxhill, Surrey, 26th April 1953. He read a note on the exhibit.

Mr. T. G. HOWARTH—Three larvae of *Daphnis nerii* L. (Lep., Sphingidae) bred from ova sent from the Kingdom of Jordan. They were about one month old and were feeding on *Vinca minor* (the Lesser Periwinkle). They had already started to feed on Oleander on arrival but readily took to the new shoots of *Vinca* when these were substituted for their old food. Other larvae of this species which arrived in January refused to feed on the old evergreen leaves of *Vinca minor*, though the leaves of Oleander on which they were feeding seemed much tougher than those of *Vinca*.

Mr. R. TUBBS—Three drawers of species of *Charaxes* (Lep., Nymphalidae) from various parts of Africa including a number of examples of mimicry between species within the genus.

Mr. D. LESTON—Larvae (in 4th and 5th instar) of the Hemipteron *Aradus cinnamomeus* Panz. (Hem., Aradidae) from Oxshott, Surrey, 10th May 1953.

Mr. M. HARRISON-GRAY—The egg cluster of an African Saturniid moth. There were 12 layers. The outermost hatched first and ate the egg shells whereupon the next layer did likewise and so on.

#### COMMUNICATIONS.

BARON DE WORMS read a paper, illustrated by the lantern and by a collection of insects, on "A Recent Visit to East Africa". (See *Trans.*)

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27th MAY 1953.

The PRESIDENT in the Chair.

The President welcomed to the meeting Dr. Asahina from Tokyo, an authority on world dragonflies.

Messrs. D. G. Hall and C. W. McCubbin were declared elected members.

#### EXHIBITS.

Mr. W. H. SPREADBURY—The Scolytid beetle *Pityogenes bidentatus* Herbst, its Tenebrionid predator *Hypophloeus linearis* F. and a billet of Scots Pine showing the borings of the Scolytid.

Mr. C. N. HAWKINS—Some Coleoptera taken on an old tree stump at Horsley, Surrey, on 21st May 1953:—*Cicones variegatus* Hellwig (Colydiidae), *Bythinus curtisii* Leach (Pselaphidae), *Abraeus globosus* Hoff. (Histeridae). He also showed a wingless Hymenopteron *Lagynodes pallidus* Boh.

Mr. A. E. GARDNER—Ten species of Trichoptera taken at a mercury vapour light in his garden at Banstead, Surrey, during 1952:—*Phryganea varia* F., *Grammotaulius strigosus* Curt., *Glyphotaelius pellucidus*

Retz., *Limnephilus affinis* Curt., *L. auricula* Curt., *L. sparsus* Curt., *Anabolia nervosa* Curt., *Stenophylax permistus* McLach., *Mystacides longicornis* L. and *Hydropsyche angustipennis* Curt.

Mr. K. A. SPENCER—Three species of Diptera (Agromyzidae) with the relative mined leaves:—(1) *Agromyza johannae* de Meij. on *Sarothamnus scoparius* (L.) Wimmer, Hampstead, Middlesex, May 1953. (2) *Phytomyza heracleana* Her. on *Heracleum sphondylium* L., Portleven, Cornwall, April 1953. (3) *P. lappae* R.-D. on *Arctium lappa* L., Hampstead, April 1953. The first two species are not known to have been previously recorded from Britain, and the third was bred for the first time in this country.

Mr. S. WAKELY—The beetle *Cryptocephalus parvulus* Muel. (Chrysomelidae) reared from a case found on birch.

Mr. F. D. BUCK—Living examples of N. African beetles including two species of Chrysomelidae and *Tentyria punctostriata* Sol. (Tenebrionidae).

Mr. V. E. AUGUST and Mr. H. R. HUTCHINGS—A flower of the Lady Orchid (*Orchis purpurea* Huds.) from a wood in East Kent.

Mr. A. BUTTERFIELD—A series of strikingly melanic specimens of *Lycia hirtaria* Clerck (Lep., Selidosemidae).

Mr. T. J. HONEYBOURNE—Larvae of *Argynnis aglaia* L., *Melitaea athalia* Rott. and *Hemistola immaculata* Thnbg. and full-fed larvae and pupae of *Argynnis paphia* L.

Mr. T. R. EAGLES—The liverwort *Marchantia polymorpha* L. with female inflorescences.

Mr. D. LESTON for Mr. E. E. SYMS—The Brassica bug, *Eurydema oleraceum* L., from Gerrards Cross, Bucks.

10th JUNE 1953.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. S. WAKELY—Galls in the stems of *Chamaenerion angustifolium* (L.) Scop. made by the larvae of *Momopha nodicolella* Fuchs (Lep., Cosmopterigidae) from Ockham, Surrey, 30th May 1953.

BARON DE WORMS—Larvae of *Odontosia carmelita* Esp. (Lep., Notodontidae) from eggs laid by a ♀ found in the New Forest, Hants., April 1953.

Mr. F. D. BUCK—Coleoptera from the Stalham area of E. Norfolk taken on 30th May 1953. (1) *Trichocellus placidus* Gyll. from sedge refuse; (2) *Colliuris melanura* L. off sedges; (3) *Galerucella pusilla* Duft. off salallows; (4) *Limnobaris pilistriatus* Steph. off sedges. He read the following note:—"The sedges on which *C. melanura* was found were standing in some five or six inches of water. The insect was most readily taken by bending the sedges down and immersing them in the water. The beetle, when present, was then found to float to the surface".

Mr. T. R. EAGLES—(1) The Staphylinid beetle *Oxyporus rufus* L. found feeding on the fungus *Pholiota praecox* (Pers.) Fr. at Bayford, Herts., 7th June 1953; (2) Lepidopterous larvae found on aspen at the same locality:—*Orthosia populeti* F., *Archicaris notha* Hb. and *Clostera curtula* L.

Mr. A. E. GARDNER—Hemiptera: the rare *Hydrometra gracilenta* Horváth, taken at Sutton Broad, Norfolk, 30th May 1953, and *H. stagnorum* L. from Epsom Common, Surrey, 19th April 1953, to show the comparison in size. Coleoptera: *Helobium multipunctatum* L. from Sutton Broad, 30th May 1953; *Malachius viridis* F. and *Cychrus caraboides* L. v. *rostratus* L. from under debris on the sandy sea-shore at Happisburgh, Norfolk, 31st May 1953. Orthoptera: a series of *Tetrix subulata* L. from a marshy spot at Egham, Surrey, 11th May 1953.

#### COMMUNICATIONS.

*Eublemma parva* Hb. (Lep., Plusiidae) had recently been taken at a number of places in southern England.

A discussion on "Standard Works on the British Insects", opened by Mr. E. E. Syms, followed.

24th JUNE 1953.

The PRESIDENT in the Chair.

#### EXHIBITS.

BARON DE WORMS—Full fed larvae of *Selenia tetralunaria* Hufn. (Lep., Selidosemidae) reared from eggs laid by a female taken in Scotland, May 1953.

Mr. R. ELTON ELLISON—A series of *Pyrgus malvae* L. (Lep., Hesperidae) from Eastbourne, Sussex, including abs. *intermedia* Schilde and *taras* Bergstr.

Mr. W. H. SPREADBURY—(1) Imagines, ova and young nymphs of *Stollia fabricii* Kirk. (Hem., Pentatomidae) from Ranmore, Surrey; (2) The wasp *Eumenes coarctata* L. (Hym., Vespidae) and its mud cell from Chobham, Surrey; (3) Specimens of flowering plants (Papilionaceae):—*Ornithopus perpusillus* L. and *Trifolium scabrum* L. from St. Martha's, Surrey.

Mr. A. E. GARDNER—Four species of Odonata:—*Aeshna caerulea* Ström. (Aeshnidae), *Leucorrhinia dubia* van der Lind. (Libellulidae) and *Enallagma cyathigerum* Charp. (Coenagriidae) collected by Mr. F. T. Vallins during his collecting trip to Aviemore, Inverness-shire, in June 1953, and *Coenagrion armatum* Charp. (Coenagriidae) from Stalham, Norfolk, 30th May 1953.

Dr. B. P. MOORE—Two species of living Coleoptera: (1) *Chrysolina menthastri* Suffr. (Chrysomelidae) from N. Hants. (2) *Lagria hirta* L. (Lagriidae), ♂ and ♀, together with their larval exuviae. These latter were taken as larvae on the dunes of the Norfolk coast on 31st May 1953, and were fed upon dried insects. They pupated on 12th June and emerged 21st and 23rd June.

Mr. T. R. EAGLES—Gall on ash caused by the mite *Eriophyes fraxini* Karp.

Mr. S. WAKELY—A larva of *Cucullia chamomillae* Schiff. (Lep., Caradrinidae) found on the Composite plant *Chrysanthemum leucanthemum* L. at Chailey, Sussex.

Mr. S. TORSTENIUS—Males, females and cases of *Epichnopteryx pulla* Esp. (Lep., Psychidae) and of *E. retiella* Newman. He read the following note:—"Males, females and cases of *E. pulla* were found on Wimbledon Common, Surrey. The cases were found some on grass-stalks or blades but most of them on birch-trunks which were exposed to the sun and closely surrounded by grass. The cases were attached to the trunks between five inches and five feet above the ground. The cases found on grass were attached to stalks or blades sticking up above the main body of the grass so that the cases were exposed to the sun. Males, one female and cases of *E. retiella* were found on a salt marsh at Benfleet, Essex. The cases were found low down on fence-posts and on pieces of wood lying on the marsh".

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8th JULY 1953.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. A. H. SPERRING—Six specimens of *Leucania l-album* L. (Lep., Caradrinidae) taken on a clear night with full moon on the shore at Poltesco, Cornwall in late June, 5 of them at flowers of red valerian. He described a mass of orchids seen in a marsh by the roadside on the way to Cornwall, which proved to be the Butterfly Orchid, *Habenaria bifolia* (L.) R.Br. Other interesting plants seen were the Veined Cranesbill, *Geranium versicolor* (L.) (*striatum* L.), not considered indigenous, and, on the cliffs, the tall spikes of *Acanthus mollis* L., another non-native species.

Mr. F. D. BUCK—Coleoptera collected by Mr. F. T. Vallins in the Aviemore district of the Scottish Highlands, including *Carabus glabratus* Payk. var. *lapponicus* Born., *Bembidion (Bracteon) litorale* Oliv. and *B. punctulatum* Drap., *Nebria gyllenhali* Schön., *Dictyopterus crenatus* Payk. and *Rhagium inquisitor* L.

Mr. T. J. HONEYBOURNE—Living ova and imagines of *Hemistola immaculata* Thnbg.

Mr. E. TRUNDELL—A specimen of *Mimas tiliae* L. with the green markings of the fore wings reduced to a spot and very dark hind wings.

Mr. M. HARRISON-GRAY—A living larva of *Citheronia regalis* F. known in parts of the U.S.A. as the "Hickory Horned-Devil".

Mr. R. TUBBS—Specimens from Kinloch Rannoch, Perthshire, of (i) *Nardus stricta* L. (Mat Grass), foodplant of *Erebia epiphron* Knoch; (ii) *Molinia caerulea* Moench. (Blue Moor Grass), foodplant of *Erebia aethiops* Esp.; (iii) *Rhynchospora alba* Vahl. (Beaked Rush), foodplant of *Coenonympha tullia* Müll.

Mr. W. H. SPREADBURY—A bee nesting-box with cells of the Mason Bee, *Osmia rufa* L.

Mr. H. S. ROBINSON—Four specimens of *Eublemma parva* Hb. taken in his m.v. light trap at Alton, Hants., this year. He said that these were of a pale form which was reputed to occur in Central Africa.

Mr. A. E. GARDNER—A pair of *Anax imperator* Leach (Odon., Aeshnidae); 3 males and two females of *Orthetrum cancellatum* L. (Odon., Libellulidae) from a gravel-pit at Poyle, Middx., 30th June 1953.

Mr. V. E. AUGUST—(i) Specimens from East Kent of *Orchis pyramidalis* L. and *O. praetermissa* L. (ii) A specimen, also from East Kent, of *Euchlora (Anomala) aenea* Deg. (Col., Scarabaeidae).

Mr. M. CHALMERS-HUNT—Two living larvae of *Apatele alni* L.

#### COMMUNICATION.

Mr. D. LESTON read a paper, illustrated with the lantern, "On Writing Exhibit Notes, Communications and Original Papers".

22nd JULY 1953.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. R. F. HAYNES—Larvae of *Papilio machaon* L. in various stages of development found recently near Stalham, Norfolk.

Mr. S. WAKELY—Newly emerged imagines of *Hemaris fuciformis* L. (Lep., Sphingidae) showing the wings darkened by scales which become detached on flight leaving clear patches.

Mr. A. H. SPERRING—Specimens of the first (May-June) brood of *Hadena thalassina* Hufn. (Lep., Caradrinidae) and a forced second (August) brood and larvae.

Mr. V. E. AUGUST—The following flowering plants from East Kent: *Epipactis palustris* (L.) Crantz and *Salvia verbenacea* L.

Dr. B. P. MOORE—Three species of Odonata from S.E. Hants., including a male *Oxygastra curtisii* Dale.

Dr. S. ASAHINA—Two Japanese books containing photographs (many of them coloured) of all stages of the Japanese butterflies.

Mr. S. WAKELY—Newly hatched larvae of *Comibaena pustulata* Hufn. (Lep., Geometridae). These immediately cover themselves with debris, often using pieces of egg shell.

Mr. T. R. EAGLES—The Cruciferous plant *Descurainia sophia* (L.) Prantl from Cromer, Norfolk. This is the food plant of *Lithostegia griseata* Schiff. (Lep., Hydriomenidae).

#### COMMUNICATION.

Mr. R. E. ELLISON had taken *Calophasia lunula* Hufn. (Lep., Caradrinidae) at Eastbourne, Sussex, on 20th July 1953.

There was a discussion on Mr. D. Leston's paper, "On Writing Exhibit Notes, Communications and Original Papers".

12th AUGUST 1953.

Mr. E. W. CLASSEY, VICE-PRESIDENT, in the Chair.

## EXHIBITS.

Mr. K. A. SPENCER—Two species of Diptera Agromyzidae thought to be new to the British list:—(1) *Phytomyza bipunctata* Hend. mining leaves of *Echinops bannaticus* Rochel at Kew, Surrey, June 1953. (2) A species which it is understood Dr. Hering proposes to name and describe as new to science, found mining the leaves of *Populus tremula* L. at Hampstead, London, N.W.3, July 1953.

Mr. R. M. MERE—*Leucania impura* Hb. (Lep., Caradrinidae), an aberration with a transverse row of black dots just beyond the end of the cell on each fore wing.

Mr. D. LESTON—A larva of *Stauropus fagi* L. (Lep., Notodontidae) found feeding on birch.

Mr. M. HARRISON-GRAY—Larvae of *Loepa katinka* Westw. (Lep., Saturniidae) in the second and third instar from Shillong, India.

Mr. T. R. EAGLES—(1) Foliage, flowers and seed pods of *Acanthus mollis* L. (2) *Leptura scutellata* F. (Col., Cerambycidae) from Bayford, Herts., August 1953. It was found in a wood where there was no beech but much hornbeam.

## COMMUNICATIONS.

*Thalera fimbrialis* Scop. (Lep., Geometridae) had been taken recently at Eastbourne, Sussex. *Trinophylum cribratum* Bates (Col., Cerambycidae) had lately occurred in numbers at light at Feltham, Middlesex. *Cucullia absinthii* L. (Lep., Caradrinidae) was reported from Plumstead, London, S.E.18.

Mr. H. S. ROBINSON read a paper, illustrated by the lantern, on "The Reactions of Night-flying Insects to Electromagnetic Radiation".

26th AUGUST 1953.

The PRESIDENT in the Chair.

The President welcomed to the Meeting Prof. and Mrs. Alexander B. Klots of the American Museum of Natural History and of the City College of New York.

Mr. K. Petersen was declared elected a member.

## EXHIBITS.

Mr. R. ELDON ELLISON—*Calophasia lunula* Hufn. (Lep., Caradrinidae) and *Thalera fimbrialis* Scop. (Lep., Geometridae) taken recently at Eastbourne, Sussex.

Mr. H. D. SWAIN—An aberration of *Aglais urticae* L. (Lep., Nymphalidae) and larvae of *Hyloicus pinastri* L. (Lep., Sphingidae) from ova laid by a ♀ found on the Field Meeting at Oxshott, Surrey, 18th July, 1953. Ova hatched about 27th July.

Mr. S. WAKELY—(i) *Sympetrum flaveolum* L. (Odon) taken on the sandhills near Deal, Kent, 29th June 1953. (ii) Imagines of *Eupithecia*

*extensaria* Freyer (Lep., Hydrimenidae) bred during May; also larvae of the same species on the Composite plant *Artemisia maritima* L. from Spurn Head, Yorks. (iii) A specimen of *Oncodes gibbosus* L. (Dipt., Cyrtidae) taken at the Chailey, Sussex, field meeting on 16th June. He read a note. (iv) An example of the yellow form of *Eublemma parva* Hb. (Lep., Plusiidae) taken by Canon T. G. Edwards on 17th August at rest on a fence at Dulwich, London, S.E.

Mr. H. G. TAYLOR—*Panaxia dominula* L. (Lep., Hypsidae) ab. *bimacula* Ckne, an example with the black markings more than usually well developed. He read a note.

Mr. F. D. BUCK—A small collection of Buprestid beetles of the genera *Stigmodera*, *Curis* and *Cisseis* from the Australian states of Victoria, South Australia and New South Wales.

Mr. R. D. WEAL—Two teratological beetles: (i) *Dytiscus circumflexus* F. (Dytiscidae) from Benfleet, Essex (31st July 1953) exhibiting, among other minor things, considerable malformation of the right anterior tarsus; (ii) *Strangalia maculata* Poda (Cerambycidae) from Epping Forest, Essex (30th July 1953) with segments 5 and 6, and 9 and 10 mis-shapen in both antennae.

Mr. R. W. J. UFFEN—Larvae of *Myelois cribrumella* Hb. (Lep., Pyralidae) boring the burs and stem of the Composite plant *Arctium lappa* L., Chiswick, London, W.4.

Mr. C. N. HAWKINS—A large ♀ specimen of *Dorcus parallelipipedus* L. (Col., Lucanidae) found on 1st August 1953, at Wimbledon, Surrey, in an old *Laburnum* tree.

Mr. T. G. HOWARTH—An example of foliar proliferation in *Polyanthus* (Primulaceae) as described by Masters, *Vegetable Teratology*, 1869, p. 104, fig. 52.

Mr. W. H. SPREADBURY—The Gasteromycete fungus *Cyathus striatus* Hoffm.

#### COMMUNICATIONS.

*Colias croceus* Fourc., typical and ab. *helice* Hb., and *C. hyale* L. (Lep., Pieridae) had been seen in S. E. Kent.

Prof. KLOTS gave a brief account, illustrated by the lantern, of an entomological expedition to arctic Canada.

9th SEPTEMBER 1953.

The PRESIDENT in the Chair.

The Chairman welcomed to the meeting Prof. Robert L. Usinger of the University of California and Herr Wagner of Mainz, Germany.

Mr. C. Renfrew was declared elected a member.

#### EXHIBITS.

Mr. G. C. D. GRIFFITHS—(1) *Melanostoma ambiguum* Fall. (Dipt., Syrphidae) Gynandromorphic specimens from Woodside Park, Middlesex, 23rd April 1953; (2) *Cinxia silentis* Harris (Dipt., Syrphidae) from Bagshot, Surrey, 23rd August 1953; (3) *Physocephala rufipes* F. (Dipt.,

Conopidae) from Chipstead and Bookham Common, Surrey; (4) *Phytomyza anthrisci* Hend. (Dipt., Agromyzidae) bred from the Umbelliferous plant *Daucus carota* L. gathered at Bagshot, Surrey, 23rd August 1953.

Mr. R. ELDON ELLISON—Melanic examples of *Cleora rhomboidaria* Schiff. (Lep., Selidosemidae)—both males and females.

BARON DE WORMS—Larvae from the New Forest, Hants.:—(1) *Atolmis rubricollis* L. (Lep., Arctiidae), *Cosymbia pendularia* Clerck (*orbicularia* Hb.) (Lep., Sterrhidae) and *Pseudoips prasinana* L. (Lep., Cymbidae).

Mr. S. WAKELY—Larvae of *Ethmia decemguttella* Hb. (Lep., Yponomeutidae) found on the Boraginaceous plant *Lithospermum officinale* L. in Surrey.

Dr. B. P. MOORE—A short series of the migrant dragonfly *Sympetrum flaveolum* L. from North Hants., 6th September 1953.

Mr. D. A. ASHWELL—Larvae of *Agrotis ripae* Hb. (Lep., Caradrinidae) from sandhills in North Norfolk.

Mr. A. E. GARDNER—Dermaptera:—*Forficula lesnei* Finot, taken by beating old nettles, etc., Blackgang, Isle of Wight, 18th August 1953. (2) *F. auricularia* L., including the form *forcipata* Steph. from Freshwater, I.O.W. Orthoptera:—(1) *Conocephalus discolor* Thnbg. from Ladder Chine, I.O.W., 16th August. (2) *C. dorsalis* Latr. from the Freshwater Marsh, I.O.W., 27th August.

#### COMMUNICATIONS.

*Aglais urticae* L. (Lep., Nymphalidae) had, within the last few days, suddenly appeared in immense numbers in many parts of Southern England.

*Volucella zonaria* Poda (Dipt., Syrphidae), several had recently been seen in Surrey, Kent, and the Isle of Wight.

*Heliothis peltigera* Schiff. (Lep., Caradrinidae), larvae were plentiful in S. Kent on the Composite *Senecio viscosus* L.

BARON DE WORMS, the Society's delegate, read his Report on the XIVth International Congress of Zoology held at Copenhagen from 5th to 12th August 1953. See page 96.

Mr. DEREK A. ASHWELL read a paper on "Experiments with *Abraxas grossulariata* (Lep., Selidosemidae)". To illustrate his paper he showed several cases of specimens arranged to demonstrate the course of inheritance. (See *Trans.*)

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23rd SEPTEMBER 1953.

The PRESIDENT in the Chair.

The Chairman welcomed to the Meeting Dr. Teiso Esaki, Professor of Entomology, Faculty of Agriculture, Kyushu University, Fukuoka, Japan.

The death of Mr. G. A. Ensor was announced.

#### EXHIBITS.

Mr. E. W. CLASSEY—Larvae of *Calophasia lunula* Hufn. (Lep., Caradrinidae) from Eastbourne, Sussex. The food-plant is Toadflax



(*Linaria vulgaris* Mill.). He reported the occurrence of wild larvae of this species along the South East coasts, from Eastbourne to Great Wakering, Essex. Work by H. S. Robinson, R. Mere, L. Christie, D. More and himself had brought to light the extent to which the species had established itself.

Mr. R. F. BRETHERTON—A living larva of *Calophasia lunula* Hufn. found in Kent about noon on 20th September. It was feeding openly on the flowers and seeds of the Yellow Toadflax (*Linaria vulgaris*), and appears to be in its last instar. The ground colour is pale blue; there are three yellow stripes on the sides and back and two broken black stripes on the sides, with a thick sprinkling of black spots on the blue ground. The appearance is thus rather that of a *Cucullia*; but in shape it resembles *Pieris brassicae*, tapering slightly towards the head and tail.

Mr. R. ELTON ELLISON—A specimen of *Luperina dumerilii* Dup. (Lep., Caradrinidae) taken at Eastbourne, Sussex, on 20th August 1953. A series of a dark form of *Cryphia perla* Schiff. (Lep., Caradrinidae) also from Eastbourne.

BARON DE WORMS—Larvae of *Euphyia luctuata* Schiff. bred from ova laid by two females taken in E. Kent on 31st August 1953. He read the following note:—

“I am showing to-night a few half-grown larvae of the White-banded Carpet Moth (*Euphyia luctuata* Schiff. = *lugubrata* Staud.) bred from two females taken in East Kent on 31st August 1953. They hatched on 6th September.

As I believe this to be the first time these larvae have been exhibited at this or any other Society in this country, I have thought it of interest to say something about the history, status and habits of this apparent newcomer among our ‘Geometers’.

The first recorded example in this country was in 1924 when a specimen was taken in North Kent by the son of Mr. F. T. Grant (*Entom.*, 58: 16) on 2nd June. We next hear of it in 1928 (*Entom.*, 61: 51) when Mr. J. Cosmo Melvil discovered a specimen in a small series of *E. unangulata* Haw. he had purchased from Mr. Gibbs. These were all labelled Woodham Ferrers, Essex. From that date we have a big jump to 1950 when Mr. G. Haggett took a female quite by chance on 6th August in Ham Street woods, Kent. He obtained ova but bred only one imago. For a most interesting account of his experience together with the life history of the species see *Ent. Gaz.*, 3: 27.

Also in 1950 two examples were found at rest on telegraph poles near Hailsham, Sussex, by Mr. B. Embry. In 1951 a vain search was made in Ham Street but later in September single specimens were taken by Mr. Duffield at Wye, Kent, and by Mr. Morley at Folkestone, Kent, and also one in Ham Street.

In 1952 the insect appeared in some numbers both in the spring and late summer in Ham Street, while in this year 1953 it has become more

common there and has also been taken again in the Folkestone area and in two other localities in Kent and one in Sussex. It is evidently spreading.

As to its habits and habitats, it appears to feed chiefly on the Rosebay Willow-herb, *Chamaenerion angustifolium* (L.) Scop. In places in woods where this is in big clumps the insect may be flushed by day. The females are easy to catch, but the males fly off rapidly, usually into a tree. On the wing it much resembles *Eulype hastata* L. in appearance. It seems to be chiefly active in the afternoon.

The species appears to have several broods. This year it was taken in late May, in late July and in early August. There were fresh examples again on the wing at the end of August constituting a probable third brood. Both Mr. Morley and Mr. Haggett bred it from ovum to imago in six weeks.

I feel sure this species is a new coloniser. It is hardly likely it could have been overlooked for so long. There is evidence that it is invading Denmark in the same way."

Mr. H. S. ROBINSON—(1) A specimen of *Hydraecia hucherardi* Mab. (Lep., Caradrinidae) taken in a light trap on the night of 13th-14th September 1953. (2) Cocoons (raised in captivity) of *Calophasia lunula* Hufn. in the seed-heads of Toadflax. He remarked that a wild cocoon similarly placed had been found by Mr. P. Cue of Ashford, indicating that this is the natural method of pupation.

Mr. L. S. WHICHER—A series of *Aphodius porcus* F. (Col., Scarabaeidae) taken at Winchester, Hants., 19th September 1953.

Mr. D. A. ASHWELL and Mr. C. CRAUFURD—Fifteen species of local Lepidoptera taken in sandy places in the Eastern Counties.

Mr. G. C. D. GRIFFITHS—A small collection of Diptera (Syrphidae and Conopidae) which he presented to the Society.

Mr. W. H. SPREADBURY—(1) A nuclear comb of a Honey Bee—*Apis mellifera* L. (Hym., Apidae) found suspended in a gorse bush at Winterdown Forest, Surrey, 22nd September 1953. (2) The fungus *Crucibulum vulgare* Tul. from the Druid's Grove, Surrey.

Mr. R. M. MERE—A larva of *Thalera fimbrialis* Scop. (Lep., Geometridae) from a female taken in Kent on 20th July 1953. It had been fed on yarrow (*Achillea millefolium* L.), was kept warm in a kitchen, and had fed up and was likely to pupate soon.

Mr. A. E. GARDNER—The following species of Orthoptera taken on the Isle of Wight, Hants., August 1953:—*Tetrix ceperoi* Bolivar, *Platycleis occidentalis* Zeuner, *Pholidoptera griseoptera* Deg., *Tettigonia viridissima* L. and *Ectobius panzeri* Steph. He also exhibited living examples of *Mononychus punctum-album* Herbst (Col., Curculionidae) bred from the seed-pods of *Iris foetidissima* L. collected in Blackgang Chine, Isle of Wight, during August.

#### COMMUNICATIONS.

Mr. L. A. ALIMONDA gave a lecture, illustrated by the lantern, on "Bird Photography".

14th OCTOBER 1953.

The PRESIDENT in the Chair.

Messrs. M. W. F. Tweedie, M.A., C.M.Z.S., and D. S. Smith, F.R.E.S., were declared elected members.

## EXHIBITS.

Mr. E. W. CLASSEY on behalf of Messrs. JOHN KNIGHT and FRANK SUTTON—Eggs of *Antitype xanthomista* Hb. (Lep., Caradrinidae) on grey rock of unknown constitution. They were cream coloured when first laid, later turning orange and then, through reddish brown and greyish brown to dull grey. Also imagines of *A. xanthomista* and of *Stilbia anomala* Haw. (Lep., Caradrinidae), all from Aber Bach near Fishguard, Pembrokeshire. He read a note.

Mr. J. W. HOARE-WARD—An aberration of *Zygaena lonicerae* Schev. (Lep., Zygaenidae) having the fore-wings slate grey with pale pink spots, from Alice Holt, Hants.

Mr. D. LESTON explained and demonstrated by a model the wing expansion in Brachyplatidae (Hem.-Het.). He read the following note: "It has long been known that the fore-wings in this family are folded when at rest; these wings are considerably longer than the abdomen of the insect and, were they not folded, would project beyond the scutellum. The mechanism of folding has not, it seems, been reported previously. The anterior area of the corium, i.e., between the costal margin and the embolium, is modified to form a hollow tube which extends on to the membrane distally. Here the tube is expanded to end in a blind sac. At rest, the anterior margin is bent through approximately 45° and the membrane at its base folds over the apex of the corium; there are two fold lines visible between the corium and the membrane proper. It is believed that, to expand the wing, blood is forced along the anterior tube into the sac; this would lead to a straightening out of the costal margin and hence complete expansion. On releasing the pressure, an act which must accompany wing folding, the natural spring of the somewhat elastic costal margin would result in a return to the folded state. No live Brachyplatids have been available for experimentation but, in specimens preserved in Bouin's fluid, a dried secretion was noted within the anterior tube and sac. The hind-wings, being shorter than the abdomen, require no folding and in fact are unmodified from the normal Pentatomoid type."

Dr. B. P. MOORE—A living last instar nymph of *Reduvius personatus* L. (Hem., Reduviidae) taken by Mr. G. E. Woodroffe in an attic of a private house at Sudbury, Suffolk. It was apparently feeding on various Dermestid larvae.

Mr. A. E. GARDNER—Male and female imagines of *Aeshna isosceles* Muel. (Odon., Aeshnidae) from Potter Higham, Norfolk, 27th June 1952. He read the following note: "An immature nymph was dredged from a dyke in the same district on 30th May 1953, this being the first specimen to be found in Britain. When found it was 20 mm. in length

and had the characteristic dark brown and yellow markings of the genus. The more sombre and mature markings were observed at the next instar, and moults occurred on 3rd June, 3rd July, 5th August, and the final nymphal stage on 26th September 1953." Spirit-preserved cast skins of the nymph were exhibited and separation characters discussed.

Mr. R. TUBBS—Exotic butterflies arranged to illustrate Mullerian mimicry.

#### COMMUNICATIONS.

There was this year what appeared to be a third brood of *Pararge aegeria* L. (Lep., Satyridae). *Lycaena phlaeas* L. (Lep., Lycaenidae) was in great abundance in the West Country. *Herse convolvuli* L. (Lep., Sphingidae) had been taken on the 12th.

Mr. H. D. SWAIN read a paper, illustrated by the lantern on "Mimicry in Butterflies".

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31 OCTOBER 1953.

#### THE ANNUAL EXHIBITION—RECORD OF EXHIBITS.

The President opened the Exhibition at 2.30 p.m. in the Libraries of The Royal Society and of the Geological Society of London at Burlington House, Piccadilly, and after once more thanking those two Societies on behalf of our Members for again lending us their splendid rooms for the occasion, welcomed the large company of Members and visitors, and thanked the Exhibitors for all the trouble and care they had taken in preparing their many interesting and instructive exhibits.

The Orders selected for special attention this year were, as in 1950, the Neuroptera and Orthoptera but, perhaps because they had been so recently dealt with, they were not very strongly represented though there were some very interesting exhibits.

There were some excellent exhibits of Diptera, Coleoptera, etc., and one of a species of Trichoptera recently added to the British List, but the majority were of Lepidoptera and among them were several of species only recently recorded or very rare in Britain. There was also an exhibit of the less common species of insects found associated with stored food products and a very interesting selection of living animals from the Insect and Reptile Houses of the Zoological Society of London of which, unfortunately, no detailed record was given to our Editor.

The following exhibits were shown:—

Mr. D. A. ASHWELL, see Mr C. CRAUFURD.

Mr. K. E. J. BAILEY—Some butterflies and varieties taken in the Oxford district:—*Agapetes galathea* L., an unusually late but fresh ♀ taken 9th September 1953. *Aricia agestis* Schiff., a ♂ underside with outer band of black spots elongated. *Maniola jurtina* L., ab. *antialba* Leeds. *Strymonidia w-album* Knoch, ab. *butlerowi* Kroul (Plate III, fig. 5a). *Argynnis paphia* L., a ♀ aberration similar to that figured by

Frohawk (*Nat. Hist. Brit. But.*, Fig. 20, p. 64) (Plate III, fig. 2). *Nymphalis polychloros* L., a ♀ taken at Shotover, April 1948. *Aglais urticae* L., a ♂ with one small central spot and a good ♂ ab. *ichneusoides* Selys-Long. *Lycaena phlaeas* L., four varieties including abs. *schmidtii* Gerh., *obsoleta* Tutt, *radiata* Tutt.

Dr. J. V. BANNER—*Coenonympha tullia* Müll., short series from South Yorks and Aviemore, Inverness-shire. *Lysandra coridon* Poda ab. *fowleri* South, taken in Sussex, August 1953. *Dasycampa rubiginea* Schiff., bred from ova; female taken on sallow, Aldershot, 26th March 1953. *Rhizedra lutosa* Hb., series from Sussex locality, boxed off reed stubble shortly after emergence. *Antitype chi* L., a series bred from a female taken in 1952 in North Derbyshire. *Apamea monoglypha* Hufn., melanic specimens from Aviemore, July 1953.

Dr. N. L. BIRKETT—(1) LEPIDOPTERA—(A) From the Kendal district:—*Erebia aethiops* Esp., *Chaonia ruficornis* Hufn., *Trichopteryx polycommata* Schiff., *Xanthorhoë munitata* Hb., *Ligdia adustata* Schiff., *Acasis viretata* Hb., *Pyrrhia umbra* Hufn., *Odontosia carmelita* Esp., *Crambus furcatellus* Zett., *Schoenobius mucronellus* Schiff., *Philedone prodromana* Hb., *Euxanthia zoegana* L. var. *ferrugana* Haw., *Lithocolletis trifasciella* Haw., *Lygris populata* L., *Pterostoma palpina* Clerck, *Anaitis plagiata* L. ab. *nigrescens* Hann., *Trichopteryx carpinata* Borkh. var., *Notodonta anceps* Goeze, *Drepana binaria* Hufn., *Apatele alni* L., *Plusia bractea* Schiff., *Gypsites leucographa* Schiff., *Cirrhia gilvago* Schiff. (B) From Aviemore, Inverness-shire:—*Brachionycha nubeculosa* Esp., *Argyroproce mygindana* Schiff. (C) From Tenby, S. Wales:—*Cryphia muralis* Forst., *Agrotis trux* Hb., *Nola albula* Schiff., *Epischnia banksiella* Rich. (D) From Grassington, Yorks:—*Stilbia anomala* Haw., *Colostygia olivata* Schiff., *Perizoma taeniata* Steph., *P. minorata* s.sp. *erivata* Curtis, *Entephria flavicinctata* Hb. (E) From Surrey:—*Crambus chrysonuchellus* Scop., *Myelois cribrumella* Hb. (F) From Essex:—*Loxostege palealis* Schiff. (2) COLEOPTERA—(A) From Kendal district:—*Elleschus bipunctatus* L., *Oiceoptoma thoracica* L. (B) From Surrey:—*Melasis buprestoides* L. (C) Exhibited on behalf of Mr. J. E. Thorpe of Kendal:—*Tritoma bipustulata* F. and *Platycis minuta* F., both taken in the Witherslack area.

Mr. C. S. H. BLATHWAYT—Lepidoptera taken during 1953:—*Erebia ephiphron* Knoch. Some specimens taken in the Langdale area of Lakeland on 6th and 9th July. *Acherontia atropos* L. One specimen taken at light at Weston-super-Mare on 24th May. *Amathes ditrapezium* Schiff. A few specimens taken in the Langdale area of Lakeland during the week commencing 4th July. *Hama albicolon* Hb. A specimen taken near Weston-super-Mare on 6th June. *Leucania l-album* L. and *L. vitellina* Hb. A specimen of each of these species taken at sugar at Swanage on 12th September. *Laphygma exigua* Hb. A specimen taken at light at Weston-super-Mare on 1st August. *Archiearis (Brepheos) notha* Hb. A few specimens taken in North Somerset on 3rd and 7th April. *Venusia cambrica* Curt. Two specimens taken in the Langdale

area of Lakeland on 4th July. *Nycterosia obstipata* Fabr. (*fluviata* Hb.). One specimen taken near Weston-super-Mare on 26th September. *Ennomos autumnaria* Wernb. One of two specimens taken at light at Dungeness on 18th September.

Mr. and Mrs. E. L. BOLTON—Aberrations of butterflies taken (except one) in Surrey, Sussex and Dorset in 1952 and 1953, including:—(1) *Maniola jurtina* L., a ♂ albino, a ♂ ab. *pupillatanulla* Leeds devoid of white pupil and a ♂ ab. *anticrassipuncta* Leeds with extremely large subapical spots taken in Ireland by Mr. L. A. E. Sabine in 1950. (2) *Coenonympha pamphilus* L., a ♀ ab. *apicoextensa* Leeds. (3) *Agapetes galathea* L., a ♂ with abnormally rounded left forewing, with asymmetrical markings. (4) *Aricia agestis* Schiff., a ♂ ab. *caeca-calida* Bellier and a ♂ similar to ab. *transformis* B. & L. of *Lysandra coridon* Poda on left fore- and hind-wing. (5) *Polyommatus icarus* Rott., ♀ ab. *aurosa* B. & L. (6) *Plebejus argus* L., ♂ ab. *postdex-transformis* B. & L. (7) *Lysandra bellargus* Rott., a ♂ ab. *suffusa* Tutt. (8) Aberrations of *Lysandra coridon* Poda including a very heavily marked ♀ underside *discoelongata* Courv.

Mr. S. R. BOWDEN—Lepidoptera:—(1) Some hybrids of the genus *Pieris*. Mr. Bowden supplied the following notes:—

(a) "An all-female brood of *Pieris napi-bryoniae* hybrids. In the course of breeding work on hybrids of British *Pieris napi* L. and Swiss (Engelbergertal) *Pieris bryoniae bryoniae* Ochsenheimer, an F.2. hybrid ♀ was caged on 2/5/52 with an F.1 hybrid ♂. About 76 ova were laid, the majority of which failed to hatch. The larvae (brood 1952—b) were reared without difficulty, and six ♀ butterflies emerged from 25/6/52 to 3/7/52. A further ♀, of "spring-form" appearance, emerged on or before 27/12/52; on 27/1/53 the remaining eleven pupae were transferred to 1° C. until 25/7/53. Nine butterflies, all ♀, emerged between 4 and 6/8/53; the other two pupae died.

The specimens differ in appearance from the normal hybrids, many giving the impression of having been dusted with soot. The structure of the wings is noticeably softer and more fragile than normal, though they are of good size. A slight pinkish tinge is often noticeable on the fore-wings.

As is well known, in hybrid Lepidoptera the females often fail to develop. In this instance it is the males that are missing.

A further point of interest here is the production of offspring by the F.2 hybrid female. Subsequent work by the exhibitor, alone and in collaboration with Mr. N. T. Easton, has so far failed to produce any full F.3 hybrids and back-crosses of F.2 hybrids to the P.1 species have been successful only when the F.2 hybrid was male."

(b) "Hybrid *Pieris napi-bryoniae*, ab. *sulphurea* Schöyen (= *hibernica* Schmidt). A male of this bright yellow form (well known in *P. napi*), bred in collaboration with Mr. N. T. Easton, was shown last year.

The present exhibit shows a selection of both sexes of the mixed brood 1952—t, obtained by pairing two ♀♀ of one F.1 hybrid brood with two ♂♂ of another F.1. hybrid brood. The original *bryoniae* ♀

parents belonged to the single-brooded typical subspecies *bryoniae* and were bred from Engelbergertal, Switzerland; the British *napi* were both homozygous *hibernica*. This recessive form re-appeared as expected in about a quarter of the 1952—*t* individuals. (The yellow males of this brood were used in further breeding experiments).

Emergences of 1952—*t* were from 10/11/52 to 26/12/52 and (pupae retarded at 1° C.) from 30/6/53 to 7/9/53. Note "summer form" obtained in December and "spring form" in September of the following year."

(c) "Hybrids of *Pieris arctica* Verity (with *Pieris bryoniae neobryoniae* Sheljuzhko.

*Pieris arctica* Vty. (= *adalwinda* Fruhstorfer) bred by G. Hesselbarth from Kiruna, Sweden, has been crossed with *P. bryoniae* Ochsenheimer, both the typical subspecies *bryoniae* (Engelbergertal, Switzerland) and the double-brooded subspecies *neobryoniae* (Loibl Pass, Kärnten, kindly supplied by H. Ryszka). Here F.1 hybrids with *P. bryoniae neobryoniae* are shown, selected from those of broods 1953—*d* and 1953—*g* which emerged the same year (18/7/53 to 12/8/53). The violet shimmer seen on some of the females is inherited from the ♂ parent, *arctica*. The butterflies are much larger than might be expected from the small size of *arctica*.

Further crossings of *arctica* have since been made with British *P. napi*, in order to obtain evidence on the affinity of *arctica* to *bryoniae* and to *napi*."

(2) *Pieris napi* (L.). Albino Form. 2nd, 3rd, 4th and 5th generation, after re-crossing with wild female in 3rd generation. "The 5th generation female has transparent sex spots; in a good light the yellow scales of the underside can be seen through the spots."

Mr R. F. BRETHERTON—Lepidoptera:—(A) *Eublemma parva* Hb., Ottershaw, Surrey, at light, 24.v.53; *Plusia gamma* L., with gamma mark reduced, Ottershaw, 24.v.53; *Crocallis elingvaria* L., male, all wings smoky, Ottershaw, 6.viii.53 (Plate II, fig. 6); *Orthosia gothica* L., three aberrant forms, Ottershaw, 10/11.iv.53; *Biston strataria* Hufn., male melanic, Ottershaw, 11.iv.53; *Nonagria typhae* Thnbg. ab. *fraterna* Treits., Ottershaw, 6.ix.53; *Heodes virgaureae* L., male with spots on

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#### EXPLANATION OF PLATE I.

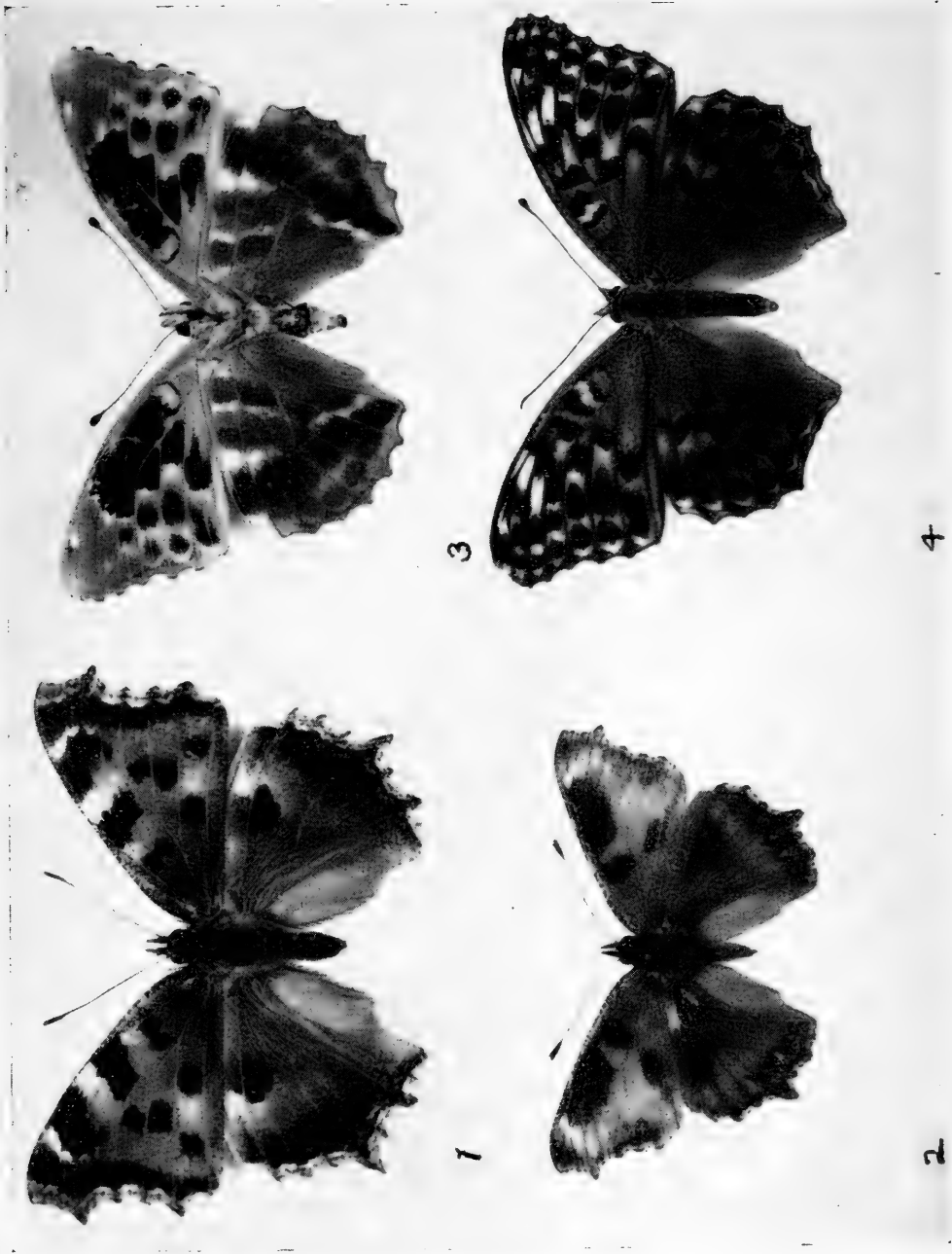
Fig. 1. *Nymphalis xanthomelas* Esp. Miss McDermott.

Fig. 2. *Aglais urticae* L. ab. Mr. H. D. Swain, New Forest, Buckler's Hard, July 5th, 1953.

Fig. 3. *Argynnis paphia* L. ab. *valezina* Esp., inbred, underside. Mr. G. B. Oliver.

Fig. 4. *Argynnis paphia* L. ab. *valezina* Esp., inbred, upperside, another specimen, with short "tails". Mr. G. B. Oliver.





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Photos. W. H. T. Tams.





underside forewings elongated; *Agriades glandon* de Pr., male with all spots on underside greatly enlarged; *Lycacides idas* L., female with inner row of spots on underside obsolete; *Cyaniris semiargus* Rott., male with all except the discal spots on underside obsolete (these last four aberrations were taken at Saint V eran, Hautes Alpes, France, 30.vii/2.viii.53). (B) *HESPERIDAE* taken at Guillestre and Saint V eran (H-A), France, 18.vii/3.viii.53:—*Lavatheria lavatherae* Esp., *Pyrgus cacaliae* Rbr., *P. serratulae* Rbr., *P. carlinae* Rbr., *P. carthami* Hb., *P. alveus* Hb., *P. sifanicus warrenensis* Vty., *P. foulquieri* Obth., *Spialia sertorius* Hffg. (C) *Erebias* taken in the same places:—*Erebia ligea carthusianorum* Frhst., *E. euryale adyte* Hb., *E. alberganus* de Pr., *E. pandrose* Bkh., *E. epiphron aetherius* Esp. and an unnamed dwarf race from Saint V eran; *E. pharte thynias* Frhst., *E. aethiopellus* Hffg., *E. gorge erynis* Esp., *E. tyndarus/cassioides* sp., *E. pluto oreas* Wrn., *E. montanus* de Pr., *E. meolans* de Pr. (D) Moths from the same places, except where otherwise stated:—60 species, including *Agroperina lateritia* Hgl., *Euxoa lucipeta* Schiff., *E. simplonia* Geyer, *Episilia cuprea* Schiff., *Calamia tridens* Hufn. (= *Luceria virens* L.) (one, Saint V eran, 7,000 feet, one Fontainebleau, 500 feet), *Celerio euphorbiae* L., *Notodonta phoebe* Sieb., *Euprepria candida* H-S., *Caloplusia hochenwarthi* Hwi., *Syngrapha ain* Hwi., *Phytometra modesta* Hb., *Zygaena sarpedon* Hb., *Z. hilaris* O., etc.

Mr. G. A. BRETT (Ministry of Agriculture and Fisheries, Infestation Control Division)—Three of the less common species of insect found associated with stored foodstuff. *Ephestia calidella* Guen e (Lep., Phycitinae)—A Mediterranean species of Phycitid found associated with Locust beans and Dried Fruit, and liable to be confused with *Ephestia cautella* Walk. *Aphomia gularis* Zeller (Lep., Galleriidae)—A very local species found associated with nut kernels and which is now showing some signs of spreading. *Dermestes peruvianus* Castelnau (Col., Dermestidae)—A species that has very rarely been recorded in this country. Its habits are very similar to those of the other commoner species of *Dermestes*.

Mr F. D. BUCK—Coleoptera:—Specimens of *Nacerdes melanura* (L.) with a map showing by means of labels and indicators the distribution of the species in London.

Dr. G. V. BULL—Lepidoptera:—*Philudoria potatoria* L. ♀♀ from between Rye and Dungeness, and two very dark *Lophopteryx capucina* L. with a pale one for comparison from Sandhurst, Kent.

Mr. B. S. BURNS—Aberrations of *Rhopalocera* captured in 1953:—(1) *Maniola jurtina* L., (a) two females with the fulvous patch on both fore-wings replaced by white, captured in Hants. during August; (b) a female with the fulvous patch on the right fore-wing replaced by white. The outer halves of the left fore- and hind-wings were white. Captured in Surrey, 8th August; (c) a female underside *ab. excessa* Leeds. This had one quite large dot and a fainter one beneath the

apical spots on both fore-wings. The hind-wings were normal. Captured in Hants., 9th August. ( *Note*.—This appears to be one of the *antiexcessa* forms of Leeds; see our *Proc.* for 1948-49, p. 92, *C.N.H.*)

(2) *M. tithonus* L., a male with every portion of the normal brown colouring and ocelli replaced by bright-golden-brown, the fulvous colouring remaining as in normal specimens. Captured in Hants., 2nd August. (3) *Aphantopus hyperantus* L., a female ab. *arete* Mill., captured in Hants., 19th July. (4) *Euphydryas aurinia* Rott., a male with the central black bands on both fore wings absent. Taken on 2nd June in Hants.

Mr. F. W. BYERS—Lepidoptera:—Second brood specimens of *Apatura iris* L. and *Gastropacha quercifolia* L.

Mr. STUART E. W. CARLIER—Lepidoptera:—*Herse convolvuli* L. found at rest at foot of wall behind herbage, 15th August 1953, Solihull, Warwickshire. *Triphaena pronuba* L., a crippled specimen with undeveloped hind wings. This insect could not fly for more than 6 feet nor rise more than an inch or two above the ground. It flew in a series of short flights always landing on its back, facing the direction from which it had come. *T. comes* Hb. ? ab. *connuba* Hb. (no black lunule in hind wings); also ? ab. *subsequa* Haw., with black band of hind wing broken into rays; the former from Solihull, Warw., the latter from nr. High Wycombe, Bucks. *Agrotis ripae* Hb. ? ab. *obotrictica* Schmt., from Sea Palling, Norfolk. *A. vestigialis* Hufn. ? ab. *trigonalis* Esp., from "Breck-sand" area of Suffolk. *Apamea monoglypha* Hufn., ranging from typical to soot-black, from Warwickshire; a dwarf from Sea Palling, Norfolk, and a reddish-purple-brown form from a Shropshire Peat-moss—this insect exactly matched the peat for colour. *Abraxas grossulariata* L., various minor vars. (including ab. *continua* Lempke) from larvae in a Birmingham suburban garden (Acocks Green) (and 2 Shropshire specimens).

Mr. H. E. CHIPPERFIELD—Some typical Lepidoptera of the Breck District and neighbouring parts of Suffolk. *Hama albicolon* Hb., *Anepia irregularis* Hufn., *Emmelia trabealis* Scop., *Lithostege griseata* Schiff., *Scopula rubiginata* Hufn., *Mesotype virgata* Hufn., *Coenotephria berberata* Schiff., *Calocalpe cervinalis* Scop. (*certata* Hb.).

Mr. Chipperfield added the following note:—

"The area in which the plant and animal life of the Breck District can continue to survive is being rapidly diminished by afforestation, cultivation of marginal land and the establishment of military camps and aerodromes. However, the local natural history societies are endeavouring to persuade the authorities to preserve at least some of the haunts where the native wild life still flourishes."

Mr. JAMES CHRISTIE—A large number (622) insects captured in a Light Trap in the form of a Ceiling Bowl. He added the following note:—*"A Mr. H. Hart of Worcester Park, Surrey, has affixed in his kitchenette a ceiling bowl fitted with a hundred watt lamp. This leaves a small space between the top rim of the bowl and the ceiling of about half an inch. Insects entering by this gap cannot or do not get out*

again, and, finally die there. At my request he emptied the bowl on the 30th September and brought the contents to me. The last previous clearance was made at the end of July. Upon examination of the contents it was found that there were no less than 644 insects there. These were divided into the following orders, which are included in the exhibit. Lepidoptera, 27; Homoptera, 35; Coleoptera, 13; Hymenoptera (Ichneumonidae), 18; Neuroptera, 3; Diptera, 526. 22 other diptera, making up the total of 644, were accidentally lost."

Mr. L. CHRISTIE—Lepidoptera:—Eight cocoons and one blown larva of *Calophasia lunula* Hufn. taken as larvae on the Crumbles near Eastbourne on the 16th September 1953. Larvae were also found at Newhaven later in the same month. Foodplant Yellow Toadflax (*Linaria vulgaris*). One cocoon opened to show pupa with special reference to the tongue sheath which extends beyond the wing cases and over three further abdominal segments.

Mr. E. W. CLASSEY, see Mr. H. S. ROBINSON.

Dr. E. A. COCKAYNE—The following Lepidoptera:—A series of 50 *Rhizodra lutosus* Hb. collected at Freshwater, I.W.; *Triphaena pronuba* L. ab. *hoegei* H.S.; *Biston strataria* Hufn. ab.; *B. betularia* L. ab., also a somatic mosaic, and an ab. *insularia* Th.-Mieg. extreme form; *Agrotis segetum* Schiff. ab.; *A. exclamatoris* L., 4 abs.; *Oria musculosa* Hb., a white ab. and ab. *divini* Alph.; *Panaxia dominula* L. ab.; *Orthosia gothica* L. ab.; *Thalpothila matura* Hufn., dilute form; *Leucania comma* L. ab.; *Colocasia coryli* L., 4 ab. *melanotica* Haverkamp; *Rusina umbratica* Goeze, albino; *Caradrina blanda* Schiff., albino; *Cosmia trapezina* L., ab. with no transverse lines; *Procytus literosa* Haw. ab. *aethiopissa* Richardson; *Eupithecia venosata* F. ab.; *Eublemma parva* Hb., from Torcross, S. Devon.

Mr. G. A. COLE—Lepidoptera caught or bred in 1953:—Series of *Nymphalis polychloros* L. bred from eggs laid by a specimen taken in Suffolk, 24th April 1953; *Euplagia quadripunctaria* Poda caught at Teignmouth, S. Devon; *Euphyia luctuata* Schiff. caught and bred East Kent; *Oria musculosa* Hb. from Wiltshire; *Cosmia diffinis* L. from Dorking, Surrey; *Odontesia carmelita* Esp. bred from a Tilgate Forest specimen; *Gortyna petasitis* Doubl. from Dorset; *Amathes ashworthii* Doubl. bred from wild larvae from N. Wales; *Actebia praecox* L. from Braunton Burrows, N. Devon and *Eumichtis lichenea* Hb. from N. Wales with examples from E. Kent, S. Devon and Dorset for comparison.

Major A. E. COLLIER—Varieties of butterflies:—(1) *Agapetes galathea* L. bred from Northants stock; (a) ♂ and ♀ upper and under sides of two forms of ab. *aperta* Rebel, which is a heterozygote; (b) ♂ and ♀ upper and under sides of two of the homozygous forms of this aberration, both parents heterozygotes, showing remarkable development in the black outlines of the border lunules of the undersides, with a strong tendency to raying on the uppersides. (2) *Maniola jurtina* L., ♀ ♀ abs. *excessa* Leeds and *biirregularia* Leeds. (3) *Pararge megera* L., a ♀ underside with an extra spot in the interneural area of each fore-wing. (4) *Lysandra coridon* Poda, a number of named aberrations.

Mr. S. COXEY—Many lepidoptera taken or bred in 1953, including *Apatele alni* L. from Abbots Wood, Sussex, and Witherslack, Lancs.; a melanic *Pseudoboarmia punctinalis* Scop. from Tilgate, Sussex; some ♂ *Hepialus lupulina* L. with extensive cream ground colour from Polegate, Sussex; a series of the pale form of *Lasiocampa trifolii* Schiff. from Dungeness, Kent, including one without the bands; a variety of *Pheosia gnoma* Fabr. from Brock, Lancs., with dark brown ground colour; dark forms of *Oporinia filigrammaria* H.-S. from near Slaidburn, Lancs.; *Odontesia carmelita* Esp. and *Trichopteryx polycommata* Schiff. from Witherslack, Lancs.; *Eustroma reticulata* Schiff. from the Lake District; *Hadena barrettii* Doubl. bred May/June 1953 from Caernarvonshire and dark forms of *Lithomoiu solidaginis* Hb. from Sheffield contrasted with a series of the paler form which occurs at Cannock, Staffs.

Mr. C. CRAUFURD and Mr. D. A. ASHWELL—Lepidoptera found in sandy places:—

(1) SANDY SALT-MARSH:—*Oncullia asteris* Schiff. Specimens reared from larvae found on Sea Aster, *Aster tripolium* L., on the coasts of Suffolk and Essex in August and September 1952. "In captivity the larvae fed readily on cultivated Golden-rod, eating the flowers, and pupated in hard oval cocoons 2 or 3 inches under the surface of the sand. On 15th August 1953 larvae were plentiful in Suffolk, a few then being in the last instar but the majority were small. Last instar larvae were found in Essex up to 29th September, and the last larva 'went down' on 2nd October. The younger larvae were all green with yellow stripes but in the last two instars many were pinkish or orange, and the black markings varied in intensity. Several larvae of *Plusia gamma* L. were also found on Sea Aster, and the two imagines reared have pink-tinged wings."

(2) SAND DUNES—HAPPISBURGH to SEA PALLING area of NORFOLK:—*Pyrrhia umbra* Hufn. "Specimens reared from larvae collected from Rest Harrow, *Ononis*, in August 1952, and fed in captivity on garden Runner Beans. The larvae vary enormously in ground colour, and if short of food are great cannibals"; *Ochropleura plecta* L. and *Axyliu putris* L.: reared from a few larvae found with the *P. umbra* on *Ononis*; *Agrotis ripae* Hb.: reared from larvae found in August 1952 "several inches under the sand around plants of Sea Bindweed, *Calystegia soldanella* L., and fed in captivity on garden Runner Beans. The larvae are nocturnal feeders and often attack the beans from the underside, without emerging from the sand. In 1953 larvae were also found around plants of the Small Bindweed, *Convolvulus arvensis* L. Some larvae pupated in the autumn, others not until the spring".

(3) SAND DUNES—SCOLT HEAD ISLAND, NORFOLK:—*Euxoa cursoria* Hufn.: a series of imagines showing great variation in ground colour and markings, "all found in bird-watching hides on 20th and 27th July 1952. On 20/7/52 19 specimens were collected from two hides, and on 27/7/52 13 specimens from one hide"; *Agrotis ripae* Hb.: reared from larvae found 27/7/52 under the sand around plants of Sea Rocket,

*Cakile maritima* Scop.; *Leucania pudorina* Schiff., *Arenostola elymi* Treits., *Petilampa minima* Haw. and *Scopula emutaria* Hb., specimens taken by Tilley lamp, 26th/27th June 1953; *A. ripae* and *Hama albicolon* Hb., specimens boxed in bird-watching hides, 20th-27th June 1953.

(4) THE BRECK SANDS AREA:—*Lithostege griseata* Schiff. and *Aspitates ochrearia* Rossi: specimens taken on Lakenheath Warren, 24th May 1953. *Anepia irregularis* Hufn.: specimens reared from larvae collected on Spanish Catchfly, *Silene otites* Sm., in August 1937. "Ova and small larvae may be collected by gathering the ♂ and ♀ flower spikes during daytime in July and early August, as the small larvae rest by day in the flowerhead. The larger larvae may be collected at night up to the 7th September, but rest by day at the base of the plant. The imago may be boxed by torchlight at the flowerheads in June. The larvae feed readily on the flowerheads of various *Silene*, *Lychnis* and *Dianthus*, and pupate underground at the base of the plant." *Heliothis virescens* Hufn. (*dipsacea* L.): a specimen reared from a red form larva found on *Silene otites*, August 1937. "The green form of the larva has also been found there."

Mr. C. H. DIXON—Lepidoptera:—*Anaplectoides prasina* Schiff.: series bred from ova laid by ♀ at Micheldever, 1st July 1952. *Amathes c-nigrum* L.: aberration taken at Micheldever, 25th June 1953. *Triphaena comes* Hb.: unusually marked moth taken at Micheldever, 13th July 1952, also series of 22 of the ab. *curtisii* Newman and 4 of the usual Scottish form bred from ova from *curtisii* ♀ taken at Forres, 15th August 1952. *Tiliacea aurago* Schiff.: two forms taken at Micheldever, 12th September 1953. *Agrochola lychnidis* Schiff.: seven moths showing considerable variation, Micheldever, 10th September-17th October 1953. *Ecliptopera silaceata* Schiff.: aberration bred from ova, Micheldever, 5th September 1951.

Mr. H. L. DOLTON—Lepidoptera:—*Coleophora solitariella* Zell.: a bred series of 22 specimens from larvae taken at Headley, Hants. Emergence was spread over five days, from 19th to the 23rd June 1953 inclusive and occurred as follows:—8 on 19th June, 6 on 20th June, 3 on 21st June, 4 on 22nd June, 1 on 23rd June.

Mr. R. C. DYSON—Lepidoptera:—*Dasycampa rubiginea* Schiff.: a series bred on apple. Ova from a female taken on Sallow near Aldershot on 26.3.53. "No variation, larvae sleeved on growing trees did not do so well as those kept in cages." *Aporophylla nigra* Haw.: a series bred from ova laid by female taken at m.v. light near Aldershot on 26.10.52. "Reared throughout in a heated breeding cage. Ova placed on potted chickweed and hatched in November 1952, larvae pupated January and February 1953, moths emerged 9.6.53-4.7.53. Average temperature in cage 70° fahrenheit." *Rhizedra lutosus* Hb.: a series of wild specimens from a locality near Eastbourne, Sussex. "They were boxed from reed stubble about 12 ins. from ground, probably shortly after wings had dried. It is doubtful if any of the specimens shown had made their first flight." *Asphalia diluta* Schiff.: An aberration taken at m.v. light from a Sussex locality. The two crossbands

on the fore-wings appear to have moved, one inwards and the other outwards partly diffusing into the ground colour. The band on the hind-wing has also moved outwards (Plate II, fig. 1). *Nonagria sparganii* Esp.: taken at m.v. light within the Brighton Borough boundary, the nearest pond a mile distant, containing reedmace. *Selenia tetralunaria* Hufn.: a pair (with ova) of the fourth brood in 1953. *Herse convolvuli* L.: larvae of the green form.

Mr. NIGEL T. EASTON—Lepidoptera:—(1) F.2 hybrids, *Pieris napi* L.  $\times$  *Pieris bryoniae* Ochsenheimer, with examples of the preceding generations. Dr. Easton supplied the following note:—"On 19.6.52 a pairing was secured between a ♀ *Pieris bryoniae bryoniae* supplied by Mr. S. R. Bowden from Swiss (Engelbergertal) stock and a ♂ *Pieris napi* var. *pallida* Frohawk. Thirty-three pupae resulted, of which 16 yielded butterflies in 1952 from 23.7.52 to 28.7.52, while the remaining 17 overwintered and produced imagines from 12.3.53 to 4.5.53 (brood '52/NB). Several *inter-se* pairings were made in 1952, from all of which fertile ova were obtained, though fertility varied widely. The actual F.2 brood exhibited ('52/S) was obtained by pairing, on 26.7.52, a ♀ of the above F.1 hybrids with a ♂ of similar origin, bred by Mr. Bowden. Of just over 100 pupae, 17 emerged in 1952 between 10.9.52 and 10.11.52; the remainder overwintered and emerged from 1.2.53 to 8.10.53 (some of the pupae being artificially retarded by storage at 1° C.). The exhibit showed a selection of the 93 butterflies bred. The expected proportion, homozygous for *pallida*, presented the characteristic albinistic appearance. While this pairing was exceptionally fertile, another, apparently similar in every respect, produced but one pupa. During 1953 back-crosses of F.2 hybrids to both *P. napi* and *P. bryoniae* were made repeatedly, but when the F.2 hybrid was the female the eggs did not hatch. The reciprocal pairings were nearly all successful and the progeny are being reared. Many attempts have also been made this year to pair '52/S butterflies among themselves or with other F.2 hybrids. The exhibitor failed to obtain any S  $\times$  S pairings: there seemed to be some form of repulsion present. Mr Bowden certainly obtained several pairings with his F.2 brood '52/t, but none of our many 'F.3' ova hatched." (2) Three examples of F.2 brood '52/P, obtained by inbreeding the F.1 brood '52/NB hybrids *inter-se*. (a) A mosaic gynandromorph showing ♀ scaling at apex of right fore-wing; otherwise all male. (b) A rare form of var. *pallida* Frohawk ♂ showing orange hind-wing veining on the underside. (c) A ♀ ab. *continua* Bryk. (3) A *Pieris rapae* L. ♀ with banded fore-wings and an extra spot on the hind-wings, taken in the exhibitor's garden at Reading, 12.8.53.

Canon T. G. EDWARDS—Lepidoptera:—A number of different species taken during the 1953 season, among which were the following: *Lophopteryx cucullina* Schiff. (found freshly emerged on maple hedge), *Hadena compta* Schiff., *Meristis trigrammica* Hufn. (variable forms), *Plusia iota* L., *Hydrelia flammeolaria* Hufn., *Plagodis dolabraria* L., *Argyroproce purpurana* Haw., *Hyponomeuta evonymella* L. (Whitfield,



Kent—at light with the exception of the first); *Cupido minimus* Fuessl. (a large specimen from St. Margarets Cliff, Kent); *Eublemma parva* Hb. (taken from a fence at Dulwich, London, on 17th August 1953—the first London record of this rarity); *Minucia lunaris* Schiff. (bred, Hamstreet, Kent); *Aplusta ononaria* Fuessl. and *Sterrhia ochrata* Scop. (Sandwich, Kent); *Euenaeidophorus rhododactyla* Schiff. (bred, S.F. Essex).

Mr. R. ELTON ELLISON—A selection of Lepidoptera taken at or near Eastbourne, Sussex, during 1953:—Species included *Luperina dumerilii* Dup., *Calophasia lunula* Hufn., *Thalera fimbrialis* Scop., *Eupithecia millefoliata* Rössl. and *Ethmia bipunctella* F. Aberrations included series of *Pyrgus malvae* L. ab. *taras* Hb., *Cryphia perla* Schiff. ab. *suffusa* Tutt, *Luperina testacea* Schiff. ab. *nigrescens* Tutt and *Meristis trigrammica* Hufn. ab. *obscura* Tutt; and single specimens of *Lophopteryx capucina* L. ab. *giraffina* Hb. and *Cleora rhomboidaria* Schiff. ab. *rebeli* Aigner. Also a series of *Melitaea athalia* Rott. from Abbot's Wood, where the species was once thought to be extinct.

Mr. L. J. EVANS—(1) LEPIDOPTERA:—Short series (bred) of the following moths: *Cucullia chamomillae* Schiff., *C. absinthii* L., *Pseudoterpna pruinata* Hufn., *Ortholitha mucronata* Scop., *Aleis repandata* L., *Triphaena pronuba* L., a pale form—straw coloured hind-wings with grey bands, normal fore-wings. *Ortholitha mucronata* Scop.—♂ and ♀ orange-brown lined form, from Sutton Park, Warwicks.

(2) PHOTOGRAPH:—The Speckled Wood, *Pararge aegeria* L.: Photograph of uncontrolled feral imago at bramble blossom (Wyre Forest, 1943). Mr Evans quoted Mr. D. F. Owen as stating (*Ent. Rec.*, 65: 18) "This species is only rarely seen at flowers and, in most cases, feeding does not take place", but said that Mr. S. E. W. Carlier told him it goes to bramble blossom and feeds, fairly regularly, in the Midlands.

Mr. R. FAIRCLOUGH—The following Lepidoptera:—(a) 10 *Hadena compta* Schiff. from Dover; (b) 9 *Arenostola morrisii* Dale from Folkestone; (c) a series of *Euphyia luctuata* Schiff., 1st brood caught in Kent, 2nd brood bred; (d) 6 *Oria musculosa* Hb. from Hants.; (e) a *Nephopterix genistella* Dup. from Dungeness; (f) a ♂ melanic *Dasychira pudibunda* L. and 2 *Harpyia bicusps* Borkh. from Balcombe, Sussex; (g) a *Calophasia lunula* Hufn. and three *Thalera fimbrialis* Scop. from Dungeness; (h) one *Cosmia trapezina* L. with a short black streak on the fore-wings; (i) one *Opisthograptis luteolata* L. ab. *lacticolor* Harrison taken at Leigh, Surrey; (j) examples of *Leucania l-album* L., *Eumichtis lichenea* Hb., *Aporophyla australis* Boisd., *Leucochlaena hispida* Geyer, *Schranckia costaestrigalis* Steph., taken at Portland in September.

Mr. J. FIRMIN—Lepidoptera:—(1) *Aglais urticae* L.: (a) Group of three insects captured at Stanway, Essex, on 8th September 1953. One an ab. *polaris* Stdgr. with strong blackish-brown bars linking central costal spots with the black spots on the inner margins of the fore-wings. The other two specimens showing an intermediate form of this aberration. (b) Series of eight insects reared from larvae collected at



Colchester in August. Imagines emerged on 14th September 1953; five specimens having shadowy bars of black scales to a greater or lesser degree between the second costal spots and the spots on the inner margins of the fore-wings, and representing forms approaching *ab. polaris*, the remaining three specimens very small and long winged and with ground colour differing from that of other insects in the same and earlier broods. (2) *Maculinea arion* L.: 3 females and 1 male taken in N. Cornwall on 10th July 1953, including a dwarf female of a very deep shade of blue, and with heavy margins and spots on the lower wings. (3) *Lysandra coridon* Poda: Two *ab. semisyngrapha* Tutt captured at Royston, Herts., on 9th August 1953. (4) *Thecla betulae* L.: Five males and five females reared from larvae obtained in Hunts. on 7th June 1953; the females showing the variation which occurs in the amount of orange on the fore-wings. (5) *Euchloë cardamines* L.: Two dwarf specimens captured, Brandon, Norfolk, on 25th May 1953. The dwarf male has the orange tips paler. (6) *Carterocephalus palaemon* Pall.: Six typical insects captured, Huntingdonshire, 31/5/53 and 7/6/53. (7) *Nymphalis polychloros* L.: Two male and two female insects and an underside. All reared from eggs laid by female captured in Suffolk, 19/4/53. Also a variety of an unusual dusky or greasy appearance with curiously elongated wings which give it a "squashed" appearance.

Mr. A. E. GARDNER—(1) A collection of British Dermaptera and Orthoptera consisting of over five hundred specimens, and including the following species:—DERMAPTERA—*Labidura riparia* (Pall.), *Labia minor* (L.), *Apterygida albipennis* (Charp.), *Forficula lesnei* Finot., *F. auricularia* L., and var. *forcipata* Steph. Also a number of living examples of Lesne's Earwig, *Forficula lesnei*, beaten from old nettle and teasel-heads, Blackgang, I.O.W., 27th August 1953. ORTHOPTERA:—*Blatta orientalis* L., *Periplaneta americana* (L.), *P. australasiae* (Fabr.), *Ectobius lapponicus* (L.), *E. lividus* (Fabr.), *E. panzeri* Steph., *Leucophaea maderae* (Fabr.), *Leptophyes punctatissima* (Bosc.), *Phaneroptera falcata* (Poda) (Continental specimens), *Meconema thalassinum* (Degeer), *Jamaicana subguttata* (Walker), *Conocephalus discolor* (Thunberg), *C. dorsalis* (Latr.), *Tettigonia viridissima* L., *Pholidoptera griseoaptera* (Degeer), *Decticus verrucivorus* (L.) (Continental specimens), *Platycleis occidentalis* Zeuner, *Metrioptera brachyptera* (L.), *Roeseliana roeselli* (Hag.), *Tachycines asynamorus* Adelung, from Carter's Seed Grounds, Raynes Park, Surrey, *Gryllotalpa gryllotalpa* L., *Nemobius sylvestris* (Fabr.), *Gryllus campestris* L., *G. domesticus* (L.), *Tetrix subulata* L., *T. ceperoi* Bolivar, *T. vittata* Zett., *Mecostethus grossus* (L.), *Stenobothrus lineatus* (Panz.), *Omocestus ventralis* (Zett.), *O. viridulus* (L.), *Chorthippus bicolor* (Charp.), *C. albomarginatus* (Degeer), *C. parallelus* (Zett.), *Gomphocerippus rufus* (L.), *Myrmeleotettix maculatus* (Thunberg), *Locusta migratoria* L. (Ladder Chine, I.O.W., Hants., August 1948, and Continental specimens), *Oedipoda caerulea* (L.) (Continental), *Calliptamus italicus* (L.) (Continental), and *Anacridium aegyptium* (L.) (Continental specimens).

(2) **LEPIDOPTERA**:—A series of *Papilio machaon* L., bred from larvae found at Stalham, Norfolk, 27th June 1952, these emerged on 22nd and 23rd May 1953. *Hyloicus pinastri* (L.): Ockham, Surrey, June 1953, and at m.v. light, Banstead, Surrey, 4th July. *Deilephila elpenor* (L.): two specimens from Banstead, June 1953.

(3) **DIPTERA**:—Two specimens of the handsome fly, *Volucella zonaria* (Poda), taken in Surrey during August 1953.

(4) **COLEOPTERA**:—A series of *Cicindela germanica* L. from Blackgang, I.O.W.; *Helobium multipunctatum* (L.), Stalham, Norfolk; *Licinus punctulatus* (Fabr.), Blackgang, and *Chlaenius vestitus* (Paykull), Ladder Chine, I.O.W.; *Colliuris melanura* (L.), Stalham, Norfolk; *Prionus coriarius* (L.), Ockham and Farnham, Surrey, and a series of the weevil *Mononychus punctum-album* (Herbst) bred from the pods of *Iris foetidissima* gathered at Blackgang, I.O.W.

(5) **ODONATA**:—Live nymphs of *Leucorrhinia dubia* (Van-der-Lind.), *Libellula quadrimaculata* L., and *Aeshna juncea* (L.) taken near Aviemore, Inverness, June 1953, by Mr. F. T. Vallins. A live nymph of *Aeshna isosceles* (Müll.) bred from an immature specimen dredged from a weedy dyke at Potter Heigham, Norfolk, May 1953. This is the first specimen to be taken in Britain.

Mr. B. GOATER—Lepidoptera taken or bred in Hampshire and adjoining counties during the past three seasons, and not previously exhibited, including a bred series of *Apatele alni* L., May-June 1952, from a wild female taken at light, Chandler's Ford, 8th June 1951; a melanic *A. megacephala* Schiff. taken at light, Chandler's Ford, 31st May 1952; four *Simyra alborensa* Goeze, Freshwater Marsh, July 1952; *Ammogrotis lucerneae* L., *Rhyacia simulans* Hufn. and *Eumichtis licheneae* Hb., Portland, 26th September 1953; six *Antitype chi* L., W. Wilts., August-September 1953; *Enargia paleacea* Esp., two specimens taken at m.v. light, Chandler's Ford, July 1951 and July 1952; *Orthosia advena* Schiff., Chandler's Ford; *Plusia ni* Hb., taken at m.v. light near Cadnam, New Forest, on 19th March 1952; and a bred series of *Plusia chryson* Esp. from Hampshire.

Mr. B. S. GOODBAN, see Mr. W. E. MINNION.

Mr. F. D. GOODLIFFE—(a) **COLEOPTERA**:—*Prionus coriarius* L., a larva found under a rotting plank lying on a sandy heath near Bordon, Hants. Kindly determined by Dr. F. I. van Emden. (b) **FLOWERING PLANTS**:—*Erica vagans* L., Cornish Heath, from the Lizard, September /53, and *Erica cinerea* L., Common Bell Heather, for comparison.

Mr. A. W. GOULD—Coleoptera—Some recent captures:—*Leistus terminatus* Hell. Borough Green, Kent, 5.7.53. Not common. *Nebria gyllenhali* Sch. Kinder Low (2070 ft.), Derby, 8.5.53. Common under stones. *Clivina fossor* L. Westerham, Darenth, etc. Immature specimens taken at Grin Low, Buxton, Derby, 3.5.53, superficially resemble *C. collaris* Herbst. *C. collaris* Herbst. (a) Lyme Regis, Dorset, 23.4.53 (ex coll. W. Watts); (b) Oxshott Common, Surrey, 30.5.53. New record for this locality. *Badister unipustulatus* Bon. Smallhythe, East Sussex,

May 1952. Not Common. *Feronia adstricta* Esch. Axe Edge (1850 ft.), Buxton, Derby, 5.5.53. A very local beetle, although widely distributed in the Midlands and North. *Amara fulva* Deg. Borough Green, Kent, 5.7.53. Taken in sand pit, not common. *Bembidion harpaloides* Serv. Ufford, Suffolk, 22.7.53. Not uncommon on fallen trees over water. *Ontholestes tessellatus* Fourc. Axe Edge (1850 ft.), Buxton, Derby, 5.5.53. In the decayed carcass of a sheep. *Catops grandicollis* Erich. Slade Green, Kent, 5.10.52. Numerous in folded piece of carpet which had been lying outdoors for some months. *Aphodius lapponum* Gyll. Axe Edge (1850 ft.), Buxton, Derby, 5.5.53. Very numerous in sheep dung. *Melasis buprestoides* L. Tillingbourne Valley, Surrey, 31.5.53. Swept from hedge. *Limonium aeruginosus* Ol. Tillingbourne Valley, Surrey, 31.5.53. Swept from hedge. *Hedobia imperialis* L. Chailey, East Sussex, 14.5.53. Swept from old willow. *Prionychus ater* Fab. Darenth, Kent, 12.7.53. Under willow bark. *Gronops lunatus* Fab. Witley, Surrey, 3.8.53. In sand-pit. "This beetle is well camouflaged and is easily overlooked when at rest on sand".

Mr. G. HAGGETT—Lepidoptera:—(1) *Eublemma parva* Hb., 9 selected examples from a series taken at Arundel, May 1953. (2) *Diarsia festiva* Schiff., selected specimens to show great range in variation from one locality, Arundel. (3) *Agrotis exclamationis* L., series from Arundel. (4) *Plusia gamma* L., dark purplish male ab., Arundel 1953. (5) *Spilosoma lubricipeda* L., a male with aberrant scaling and without black markings. (6) *Tholomiges turfosalis* Wocke, series from Storrington. (7) *Oria musculosa* Hb., a series from Devizes, mostly taken newly emerged at rest on wheat ears. July 1953. (8) *Cryphia divisa* Esp. (*rantrricula* Hb.), a male, taken at M.V. trap, Arundel, 12th August 1953. *Species new to Britain*. (9) *Euphyia luctuata* Schiff., series from Kent, August 1953. (10) *Caradrina alsines* Brahm, female ab. nov. with black basal band as far as median area. Arundel, 1953. (11) *Apatele rumicis* L., female ab. with dark mottling, Arundel, 1953.

Moths and larvae (preserved by H. E. Hammond) of the following species known only in recent years to be indigenous to Britain. *Catocala fraxini* L., *Minucia lunaris* Schiff., *Hadena compta* Schiff., *Calamia tridens* Hufn. (= *Luceria virens* L.), *Diarsia florida* Schmidt, *Sedina buettneri* Her., *Aplasta ononaria* Fuessl., *Thalera fimbrialis* Scop., *Euphyia luctuata* Schiff., *Eupithecia millefoliata* Rössl., and preserved larvae of *Calophasia lunula* Hufn.

Mr. H. E. HAMMOND—Two cases of preserved Lepidopterous larvae comprising 170 specimens of 87 species and including the following:—*Apatura iris* L.; *Agapetes galathea* L.; *Erebia aethiops* Esp.; *Laotoë populi* L., an aberrant specimen with sub-dorsal rows of large red spots on segments 2 to 9 with another pair on segment 11, in addition to the red spiracular patches which are well pronounced; *Herse convolvuli* L. from ♀ taken at Whetstone and reared by Mr. Roderick Lovell; *Daphnis nerii* L. reared by Mr. T. G. Howarth from Jordan ova supplied by Mr. Trevor Trought; *Eilema complana* L.; *E. deplana* Esp.;

*Lophopteryx cucullina* Schiff.; *Harpysia furcula* Cl.; *Stauropus fagi* L.; *Deilephila porcellus* L., the scarce green form taken by Mr. A. J. Wightman; *Thyatira batis* L.; *Habrosyne pyritoides* Hufn., a series of four showing great variation in colour, one specimen from Sutton Park, Warwickshire, being jet black; *Spilosoma urticae* Esp.; *Moma alpium* Osbeck; *Simyra albovenosa* Goeze; *Cryphia perla* Schiff.; *Ceramica pisi* L., a jet-black specimen with pure white lines; *Hadena w-latinum* Hufn.; *H. suasa* Schiff.; *H. thalassina* Hufn.; *H. conspersa* Schiff. including a jet-black specimen; *Aporophyla nigra* Haw.; *Antitype xanthomista* Hb.; *Eumichtis adusta* Esp.; *E. lichenea* Hb.; *Allophytes oxyacanthae* L., two beautifully marked specimens from Brockenhurst, Hants.; *Dypterygia scabriuscula* L.; *Apamea monoglypha* Hufn.; *Leucania favicolor* Barr.; *L. l-album* L.; *Meristis trigrammica* Hufn.; *Caradrina blanda* Schiff.; *Orthosia populeti* Fab.; *O. advena* Schiff.; *Conistra vaccinii* L.; *C. ligula* Esp.; *Dasycampa rubiginea* Schiff. (the last three species were reared by Mr. A. J. Wightman from females taken in the Autumn of 1952, and successfully hibernated); *Jodia croceago* Schiff.; *Lithophane semibrunnea* Haw.; *L. socia* Hufn.; *Jaspidia fasciana* L. (*pygarga* Hufn.); *Eustrotia olivana* Schiff.; *Plusia ni* Hb.; *Abrostola triplasia* L.; *Calophasia lunula* Hufn.; *Calamia tridens* Hufn. (*virens* L.) reared by Mr. H. S. Robinson, Mrs. G. Haggett and the Exhibitor from ova supplied by H.S.R.; *Catocala sponsa* L.; *C. promissa* Schiff.; *Bomolocha crassalis* Fab. (*fontis* Thnbg.); *Hyppena rostralis* L.; *Archiearis* (*Brephos*) *notha* Hb.; *Aplasta ononaria* Fuessly; *Thalera fimbrialis* Scop. reared by Mr G. M. Haggett and Mr. H. S. Robinson; *Ortholitha mucronata* Scop.; *Larentia clavaria* Haw.; *Mesotype virgata* Hufn.; *Ecliptopera silaceata* Schiff.; *Thera variata* Schiff.; *Epirrhoë galiata* Schiff.; *Euphyia luctuata* Schiff., reared by Mr. H. S. Robinson; *Eupithecia irriguata* Hb.; *E. tenuiata* Hb.; *E. inturbata* Hb.; *Cleora cinctaria* Schiff.; *Pachycnemia hippocastanaria* Hb.; *Aspitates gilvaria* Schiff.; *Gonodontis bidentata* Cl., a beautifully marked specimen with red, white and green predominating, from The Wrekin, Shropshire, on Bilberry; *Aegeria tipuliformis* Cl.; *Hepialus humuli* L.

Commander G. W. HARPER, R.N.—Lepidoptera:—(1) Taken or bred in 1953 from Inverness-shire, Scotland, including *Euchloë* (*Anthocaris*) *cardamines* L. and *Poecilopsis lapponaria* Boisd., which are new records for the Badenoch district; variable forms of *Orthosia incerta* Hufn., including the only yellow individual seen among 702 examined; *O. gothica* L., *O. gracilis* Schiff., *Stilbia anomala* Haw., *Triphaena sobrina* Boisd., *Amathes castanea* Esp., *Aporophyla lutulenta* Schiff., *Eulype subhastata* Nolcken, *Lampropteryx suffumata* Schiff., *Gonodontis bidentata* Cl., and *Erebia epiphron* Knoch. Also a bred ♂ *Orgyia recens* Hb. from Barton Broad, and captured *Hydrillula palustris* Hb., *Chilodes maritima* Tausch., *Meliana flammea* Curt., *Leucanea pudorina* Schiff., *Phragmatoecia castaneae* Hb. from the Cambridgeshire Fens, June 1953. (2) On behalf of M. W. HARPER—A

fresh ♂ *Euphyia luctuata* Schiff. from a new mid-Sussex locality; an aberrant form kindly determined by Dr. Cockayne.

Mr. J. L. HENDERSON—Coleoptera:—Series of *Dytiscus semisulcatus* Müller, *D. marginalis* L. and *D. circumflexus* F.

Mrs. E. A. HESLOP—Lepidoptera:—*Apatura iris* L. A large male taken by the Exhibitor in Wiltshire on 21st July 1953.

Mr. I. R. P. HESLOP—Lepidoptera:—The following specimens, all taken in 1953 by the Exhibitor: (A) *Euphydryas aurinia* Rott. A series of 22 specimens (14 males and 8 females) taken in May and June on the Turf Moor, Somerset, and including a remarkable lightly-scaled aberration of the male. (B) *Apatura iris* L. A fine male taken in Wiltshire on 13th July. (C) *Thecla betulae* L. A series of 35 specimens (12 males and 23 females) bred from larvae collected in May and June in Somerset. Two of the male specimens show an enlargement of the light patch on the forewing, in the direction of female pattern.

Mr. T. J. HONEYBOURNE—Lepidoptera:—(1) Four *Argynnis paphia* L. bred from a pair taken at Cliffe, Kent, on the 19th July, 1952. Also a live ♀ which emerged on October 23rd, 1953, from a pairing from this brood, one larva having fed up at once, though no artificial heat was used. (2) A *Daphnis nerii* L. taken on a shop front at Jaywick, Essex, on 9th September, 1953.

Mr. and Mrs. T. G. HOWARTH—Two cases of Lepidoptera containing: (A) Rhopalocera:—A series of upper and undersides of *Plebejus argus* L. from the Land's End district, Cornwall, July 1953, including several aberrations. A series of male upper and undersides of *Lysandra coridon* Poda aberrations taken in July-August in the Chilterns, including a mixed gynandromorph mostly male but with patches and streaks of female on the left side, mostly in the hindwing; also examples of *angustimargo* Tutt, *inframarginata* B. & L., *albonigrofimbriata* Tutt (upper and undersides), *anticaeca* + *postobsoleta* B. & L., *parvipuncta* Rebel, *confluentiae* B. & L. and *foverleri* South. (B) Heterocera:—Specimens caught in a mercury-vapour light trap in their garden at Arkley in south Hertfordshire. These were: (1) A perfect male *Herse convolvuli* L., 12.10.53. (2) *Luperina dumerilii* Dup., a perfect male of this rare migrant taken on 24.9.53, the first Hertfordshire record (*Ent. Gaz.*, V, p. 116). (3) *Leucania vitellina* Hb., a perfect male, 27.9.53, the first Hertfordshire record (*Ent. Gaz.*, V, p. 116). (4) *Dasypolia templi* Thnbg. taken in October 1952, the first Hertfordshire record (*Ent. Rec.*, 65, p. 325). (5) *Cynia mendica* Cl., two males with a whitish cloud in the discal area of the forewings. (6) *Orthosia gothica* L., a specimen with the upper part of the mark between the orbicular and reniform stigmata separated from the lower.

Mr. G. E. HYDE—British Lepidoptera:—*Lysandra coridon* Poda, various forms, Sussex, August 1953; *Maniola jurtina* L., dwarf male example, North Lincs., July 1953; *Coenonympha tullia* Müll., various forms, South Yorks., June 1953; *Pararge aegeria* L., female example with unusually extensive pale markings, South Yorks., May 1953; *P.*

*megeva* L., female showing lack of scales, Sussex, August 1953; *Spilosoma lutea* Hufn., various forms bred from female caught at Bristol, May 1953.

Captain R. A. JACKSON—Lepidoptera:—Single specimens of *Plusia ni* (Hb.) and *Eublemma parva* (Hb.) taken at Codford St. Mary, Wilts., in June and May respectively; two specimens of *Eupithecia insigniata* (Hb.), a variety of *Xanthorhoe montanata* (Schiff.) almost devoid of markings apart from a large dark patch round the orbicular (Plate II, fig. 5), and a short series of colour variations of *Oria musculosa* (Hb.), three being greenish, one cinnamon red and two dark brown. He also showed a variable series of *Orthosia advena* Schiff. (*opima* Hb.) which, he said, had been very common in 1953, and a bred series of *Cosmia affinis* L. showing variation in the white markings.

Mr. S. N. A. JACOBS—Original water-colour drawings of Pyralid moths for use in Plates IX, X, XI and XII in the revised edition of Beirne's "British Pyralid and Plume Moths" contemplated by Messrs. Warne Bros.

Mr. F. V. L. JARVIS—Lepidoptera:—A short series of *Apatura iris* (L.) comprising 4 ♂♂ and 4 ♀♀ reared from larvae collected in Surrey and Sussex in April and May 1953; the imagines having emerged between June 18th and June 28th, 1953. A plate of coloured drawings was exhibited showing all stages of development with full explanatory notes. The drawings were made during growth of this material, augmented by ova found in the same localities in July 1953. The origin of the maxillary palpi of the imago was traced from the first larval instar. The duration and nature of the larval diapause were described.

Col. S. H. KERSHAW—Lepidoptera collected in 1952 and 1953 in Bedfordshire and Gloucestershire, or bred as stated below:—(A) RHOPALOCERA. (i) *Aglais urticae* (L.) showing variation in ground colour and spotting in a local colony in 1952-1953 in Beds., all taken wild. (ii) *Nymphalis io* L. with brown spot in red of f.w.s. (iii) *Lysandra coridon* (Poda) underside female ab. *obsoleta* Tutt, taken Gloucs., August 1953. (iv) *L. bellargus* (Rott.) males similar to the ab. *caeca* Courv. of *L. coridon*, taken Gloucs., 1953. (B) HETEROCERA. (i) *Menophra abruptaria* Thnbg., two male and two female abs. between ab. *fuscata* Tutt, and ab. *unicolor* Tutt, bred from a melanic female taken in Beds. in 1952. (ii) *Panaxia dominula* L. ab. *bimacula* Cockayne bred from Kent ova.

Dr. HAROLD KING—Lepidoptera:—(1) A series of "pugs" bred or taken in 1952 and 1953. *Eupithecia irriguata* Hb. from the New Forest; *E. tantillaria* Bsdv. (*pusillata* Schiff.) from the New Forest; *E. venosata* Fab. bred from the Salisbury area; *E. expallidata* Dbld. bred, from Wiltshire; *E. absinthiata* Cl. bred, from Cornwall, Dorset, Hants and the Wyre Forest; *E. subumbrata* Schiff. (*scabiosata* Borkh.) from Dorset, 3 taken on the wing and 1 bred from *Valeriana officinalis*; *E. lariciata* Freyer from the New Forest; *E. castigata* Hb., 3 bred,



from Dorset, Wilts. and Hants. and 2 captured in Hants.; *E. satyrata* Hb. ab. *fagicolaria* Robson and Gardner, bred from *Valeriana officinalis* from Dorset; *E. haworthiata* Dbld. bred from Dorset larvae; *E. valerianata* Hb. bred from *Valeriana officinalis*, Dorset; *E. plumbeolata* Haw., 1 bred from New Forest larva, others taken on the wing in Merionethshire, Hants. and Dorset; *E. inturbata* Hb. bred from Dorset larvae; *E. fraxinata* Crewe bred from ova from female taken by Mr. S. Wakely at Dymchurch, Kent; *E. abbreviata* Steph. taken in the New Forest; *E. dodoneata* Guen. mainly taken flying round *Quercus ilex* in Hants. but 1 from Dorset, bred from oak; *Gymnoscelis pumilata* Hb. bred from larvae found on *Lythrum salicaria*, Hants. and Dorset; *Chloroclystis debiliata* Hb. from the New Forest. (2) A series of *Schranksia taenialis* Hb. taken at sugar in the New Forest. (3) An aberration of *Lysandra coridon* Poda from Alton Barnes, Wilts.

Mr. M. J. LEECH—Lepidoptera from:—(1) Hailsham and Abbot's Wood, Sussex. *Stauropus fagi* L., *Drymonia dodonaea* Schiff., *Apatele aceris* L., series of *Eilema sororcula* Hufn., *Agrotis denticulata* Haw. (*cinerea* Schiff. nec Hufn.), *Hadena w-latinum* Hufn. (*genistae* Borkh.), *Heliophobus anceps* Schiff., *Zenobia retusa* L., *Drepana binaria* Hufn., *Pseudoips prasinana* L. (*bicolorana* Fuessley), *Tethea* or Schiff., *Jaspidia fasciana* L. (*pygarga* Hufn.), *Ectypa glyphica* L., *Plagodis dolabraria* L., *Pseudoboarmia punctinalis* Scop., *Xanthorhoë spadicearia* Schiff., *Horisme vitalbata* Schiff., *Cosymbia annulata* Schulze, *Scopula marginepunctata* Goeze (bred, var.), *Electrophaës corylata* Thnbg., *Semiothisa notata* L., *Mysticoptera sexalata* Retz. (2) Dungeness, Kent. Short series of *Lasiocampa trifolii* Schiff., bred series of *Malacosoma neustria* L. and *Euproctis chrysorrhoea* L., series of *Hadena lepida* Esp., *H. conspersa* Schiff., *H. albimacula* Borkh., *Ethmia bipunctella* Fab. (3) Ham Street, Kent. *Hemaris fuciformis* L., *Herminia barbalis* Clerck, *Eulype hastata* L., *Sterrhia trigeminata* Haw. (4) Witherslack, Westmorland. Series of *Notodonta anceps* Goeze and *Chaonia ruficornis* Hufn., the latter "very plentiful at Ultra Violet Light in the spring" *Menophra abruptaria* Thnbg. (5) Formby, Lancashire. Bred *Harpyia furcula* Clerck, series of *Comacla senex* Hb. and *Procris statices* L., *Plusia ni* Hb. a single specimen taken at U.V.L., August 8th, 1953. Bred specimens of *Epione repandaria* Hufn. (6) Delamere, Cheshire. *Dypterygia scabriuscula* L., series of *Erannis aurantiaria* Hb. and

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#### EXPLANATION OF PLATE II.

Fig. 1. *Asphaltia diluta* Schiff. ab. Mr. R. C. Dyson.

Fig. 2. *Polygonia c-album* L. ab. Mr. N. C. Pilleau.

Fig. 3. *Agrotis segetum* Schiff. ab. Mr. H. S. Robinson and Mr. E. W. Classey.

Fig. 4. *Orthosia munda* Schiff. ab. Mr. Austin Richardson.

Fig. 5. *Xanthorhoë montanata* Schiff. ab. Capt. R. A. Jackson.

Fig. 6. *Crocallis elinguaris* L. smoky ab. Mr. R. F. Bretherton.



1



2



3



4



5



6

*Photos. W. H. T. Tams.*

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*Operophtera fagata* Scharf. (7) Sheffield, Yorkshire. Short series of *Lithomoia solidaginis* Hb. with specimens from Cannock Chase for comparison. (8) Bolton, Lancashire. *Hadena bombycina* Hufn. (*glauca* Hb.) from the local moors. (9) N. Lancashire. Short series of *Eustroma reticulata* Schiff.

Mr. D. LESTON—(1) Three drawers of Pentatomidae (Hem.), showing the tremendous diversity of this group. (2) *Capsus wagneri* Rem. (Hem., Miridae), an addition to the British list. The specimen is a male from Wicken Fen.

Brigadier C. G. LIPSCOMB—Varieties of butterflies: (1) *Argynnis selene* Schiff., an extreme melanic ab. and one with normal ground colour replaced with pale cream, both males taken near Taunton, Somerset, in June 1950 and 1951 respectively. (2) *Maniola jurtina* L., a ♂ ab. *grisea-aurea* Oberth. taken at Winspit, Dorset, 3rd August 1948, and a ♀ with normal ground colour replaced by pale cream-fawn, taken near Salisbury, Wilts., 28th August 1953. (3) *Lysandra coridon* Poda, 2 ♂ undersides, one with forewings ab. *radiata* Courv. and hindwings with cream ground colour, taken in Wilts., 26th August 1953, the other an extreme form of *ultranubila* B. & L., with all wings, fringes and body darkly suffused with grey-brown, taken at Royston, Herts., 5th August 1951.

Dr. B. J. MACNULTY—Lepidoptera:—*Malacosoma castrensis* L., *Agrotis trux* Hb. (*lunigera* Steph.), *Hadena albimacula* Borkh., *Aporophila australis* Bdv., *Leucania vitellina* Hb., *Cosmia diffinis* L., *Zenobia retusa* L., *Plusia chryson* Esp., *Aplasta ononaria* Fuessl., *Sterrrha ochrata* Scop., *Odezia atrata* L., *Acasis viretata* Hb., *Thera cognata* Thnbg., *Hudriomena furcata* Thnbg., *Siona lineata* Scop., *Zygaena palustris* Obth., *Procris geryon* Hb., *Aegeria chrysidiformis* Esp. and a large number of species of Micro-lepidoptera.

Miss C. A. McDERMOTT—(A) Lepidoptera:—(1) *Nymphalis xanthomelas* Esp., caught in Kent, 2/7/53 (Plate I, fig. 1) (see also the report of our meeting of 11.xi.53 for differences between this species and *N. polychloros*.) (2) *Maniola jurtina* (L.): (a) Female caught in Kent, 7/7/53, with unusually large area of orange on upper-side fore wings and a large patch of orange on upper-side hind wings. (b) Female caught in Kent, 19/7/53, with two spots (1 small) below the apical spot on the under-side fore wings and four spots on the under-side hind wing. (3) *Euchloë cardamines* (L.). Female bred from an egg found in Kent, hatched 21/4/53; upper-side hind wings suffused with orange. (4) *Lysandra coridon* (Poda). (a) Female bred from pair captured in Somerset in 1952, hatched 19/7/53; ab. *arcuata* Courv. and 2 spots joined together at top and a bar at bottom of under-side hind wings. (b) Female bred from pair captured in Somerset in 1952, hatched 22/7/53. Ground colour of under-side all wings very dark. (5) *Polyommatus icarus* (Rott.). Female caught at Hod Hill, Dorset, 16/9/53. Under-side ab. *arcua* Wheeler, upper-side very blue and no orange markings. (6) *Thecla betulae* (L.) (a) Male bred from

a female captured in Somerset in August 1952, hatched 9/7/53; has two small additional orange patches. (b and c) Females bred from a female captured in Somerset in August 1952 hatched 15/7/53 and 17/7/53. Both have faint sub-marginal orange band on upper-side hind wings. (7) *Lycaena phlaeas* (L.). Female caught in Somerset 25/9/53 has upper-side hind wings suffused with copper and has two blue spots. (8) *Pieris brassicae* (L.). Male bred from a batch of eggs found in Somerset in August 1952, hatched 14/5/53. Has apical markings pale brown and the scales on the upper wings look larger and longer than usual. The nervures show through the scales. (9) *Pieris rapae* (L.). (a) Female caught in Kent 14/7/53 has a black bar along the anal edge of the upper-side fore wings. (b) Male caught in Kent 5/5/53 has no apical black marking on the upper-side fore wings. (B) Photographs:—(1) Of the nest of the Wood Ant, *Formica rufa* L. from Mere-worth Woods, Kent; the nest was situated at the end of a fallen tree trunk. (2) Of a butterfly cage with Chalkhill Blue, *Lysandra coridon*, feeding on buddleia. (3) Of a Death's-head Hawk Moth, *Acherontia atropos* L. and its pupa. Photographed by Mr. G. Garratt.

Lt.-Col. W. B. L. MANLEY—Lepidoptera—(A) A selected series of *Acleris cristana* Schiff. and *A. hastiana* L., obtained in 1953. Amongst the sixty specimens of the former, which were taken in Sussex, were several uncommon forms such as *attaliana* Clerck, *ruficostana* Curtis, *gumpinana* Johnson (without white vitta), together with an aberration of *cristana* Donovan, in which the white "V" is represented by a broad white streak from the disc to the base of the forewings. The series of *hastiana* consisted of 60 specimens bred from larvae taken near Sandwich and 150 from larvae taken near Porthcawl, Glam. (B) A series of twenty-two species of Lycaenidae taken in France between 14th July and 4th August 1953, mostly at high levels on the Italian Frontier in the Hautes Alpes. In the series were *Agrodiaetus ripartii* Freyer (*rippertii* Bsdv.), *Albulina orbitulus* de Prun., *Aricia nicias* Meig. race *donzelii* Bsdv., *Polyommatus eros* Ochs., *Lampides boeticus* L., and a large race of *Lycaeides idas* L. of which most of the females were suffused with blue. The last species was found abundantly at Guillestre at 3,800 ft.

Mr. E. L. MARTIN—A species of *Recurvaria* (Lepidoptera: Gelechiidae), new to Britain, taken at Pinner, Middlesex, in June 1952 by Mr. W. E. Minnion. "The species is either *R. piceaëlla* Kearfott, or represents a very closely allied undescribed species. Although the single male specimen has been compared with the type of *Recurvaria piceaëlla* Kearf. in the United States National Museum, a safe decision cannot be made unless more material becomes available." The two other British species, *R. leucatella* Clerck and *R. nanella* Hb., were included for comparison.

Dr. A. M. MASSEE—Three very rare British Heteroptera collected during 1953, *Holcostethus vernalis* Wolff. (Pentatomidae), *Pyrrhocoris apterus* L. (Pyrrhocoridae) and *Trapezonotus ullrichi* Fieb. (Lygaeidae).

Mr. R. M. MERE—Lepidoptera:—*Thalera fimbrialis* Scop. Bred 20th July 1953 from a wild larva found in S.E. Kent on Yarrow. *Plusia ni* Hubn. Taken at mercury vapour in his garden at Chiddingfold, Surrey, on 12th August, 1953. *Eublemma parva* Hubn. Taken at mercury vapour in his garden on 25th May 1953.

Mr. H. N. MICHAELIS—LEPIDOPTERA: (A) Imagines:—*Aricia agestis* (Schiff.)—Millers Dale, Derbyshire. *Lophopteryx cucullina* (Schiff.)—Dorset (Swanage). *Lasiocampa quercus* (L.)—Goyt Valley and Frandley, Cheshire. *Saturnia paronia* (L.)—From East Cheshire Moors. *Apatele menyanthidis* (View.)—Holker (Lancs.) and Goyt Valley (Cheshire). *Antitype chi* (L.)—Lancs., Ches., and Derbyshire. *Luperina gueneei* Doubl.—Degannwy, N. Wales, August 1926. *Tholera cespitis* (Schiff.)—Delamere, Ches. *Arenostola pygmina* (Haw.)—Staley Brushes, Ches. *Hydriomena furcata* (Thunb.)—Goyt Valley, Ches. *Venusia cambrica* Curt.—Goyt Valley, Ches., including a dark form. *Entephria caesiata* (Schiff.)—Goyt Valley, Ches. *Europhila badiata* (Schiff.)—Cotterill Clough, Ches., including dull smoky forms. *Deuteronomus fuscantaria* (Steph.)—Didsbury, Lancs. *D. alniaria* (L.)—Didsbury, Lancs., and Delamere, Ches. *Gonodontis bidentata* (Clerck)—Manchester district, including black form. *Myelois cribrumella* (Hb.)—Spurn, Yorks. *Crambus perlellus* (Scop.)—Forms from salt marsh, peat moss and limestone areas. *C. hamellus* (Thnbg.)—Wilmslow, Cheshire. *Scoparia pallida* (Steph.)—Wilmslow, Cheshire. *S. ambigua* (Treits.)—Goyt Valley, Cheshire, including dull smoky form. *Lozopera francilana* (Fab.)—Spurn, Yorks. *Chlidonia baumanniana* (Schiff.)—Formby, Lancs. *Peronea mixtana* (Hb.)—Forms from the Cheshire moors and mosses. *Eucosma citrana* (Hb.)—Spurn, Yorks. *E. nisella* (Clerck)—Delamere, Cheshire. *Argyroproce mygindana* (Schiff.)—Staley Brushes, Ches. *Gelechia hippophaella* (Schr.)—Spurn, Yorks. *Dichomeris marginella* (Fab.)—Arnside, Westmorland. *Yponomeuta padella* (L.)—Didsbury, Lancs., dark forms. *Elachista subalbidella* (Schläger)—Formby, Lancs. *Borkhausenia subaquileia* (Staint.)—Goyt Valley, Ches. *Ochsenheimeria bisontella* Zell.—Crowden, Ches. *Coleophora lixella* Zell.—Millers Dale, Derbs. *Ypsolophus sequellus* (Clerck)—Millers Dale, Derbs. *Homocosoma sinuella* (Fab.)—Spurn, Yorks. *Bactra robustana* Christoph.—Burton, Ches.

(B) Mines of species of Genus *Lithocolletis*.

(C) Leaves mined by species of the genus *Coleophora* showing, in some instances, the 'cut out' made by the larva in constructing its final case. The earlier case is usually left near the base of the old leaf. Included also are the first and second year cases of *Coleophora ritisella* Gregson.

(D) Larval habitation and specimens of *Gracillaria betulicola* Hering from Delamere and Wilmslow, Cheshire. New to Cheshire List.

Mr. W. E. MINNION and Mr. B. S. GOODBAN—LEPIDOPTERA:—*Bena fagana* Fab., 4 specimens, including 2 ab. *leucozona* Cockayne from Dunsfold, Surrey, 23/5 and 13/6/53. *Apatele menyanthidis* View., examples

from Scotland and S. Yorks., including ab. *suffusa* Tutt, S. Yorks., bred 20/5/53. *Achlya flavicornis* L., including two with ochre coloured stigmata, N. Middlesex, April '47 and April '53. *Colocasia coryli* L., two melanic specimens, Amersham, 31/5/47, and Ruislip, 28/5/53. *Amathes xanthographa* Schiff., 4 specimens, including one albino, Dunsfold, 29/8/53. *Epione repandaria* Hufn., short series bred June-July 1953, Ruislip and Dunsfold. *Nola albula* Schiff., Shoreham, 28/7/53. *Eublemna parva* Hb., Dunsfold, 23/5/53. *Xanthorhoe fluctuata* L., an extremely assymetrical specimen, Pinner, 13/9/53. *Endotricha flammealis* Schiff., a melanic example, Pinner, 12/8/53. Also 45 photographs of moths and larvae.

Dr. B. P. MOORE—A collection of British Odonata prepared with special attention to colour preservation (cf. our *Trans.*, 1949-50, pp. 179-86).

Mr. A. M. MORLEY—LEPIDOPTERA:—(1) *Nymphalis io* (L.), a specimen which looks as if it had been dipped in oil, taken alive on the Folkestone Downs, 29.viii.53. (2) *Acherontia atropos* (L.), a ♀ which flew around a m.v. lamp and settled near it at 10.15 p.m., Folkestone, 15.ix.53. (3) *Herse convolvuli* (L.), a ♂ found in a moth-trap, Folkestone, 18.ix.53. (4) *Euproctis chrysorrhoea* (L.) (*phaeorrhoea* (Don.)), a ♂ ab. *punctigera* Teich., Folkestone, 20.vii.53. (5) *Orgyia antiqua* (L.), Folkestone, 16.ix.53. A ♂ found in moth-trap, much darker than normal local specimens. (6) *Pseudoips prasinana* L. (*bicolorana* (Fuessly)), Folkestone, 19.viii.53. A new record for the Folkestone-Romney Marsh district. (7) *Cryphia perla* (Schiff.), Folkestone, 31.vii.-26.viii.53. A series of 13 showing variations of forms *lutescens* Fuchs and *suffusa* Tutt. (8) *Agrotis exclamationis* (L.), Folkestone, 11.vi.-21.vii.53. 8 examples of ab. *plaga* Stephens. (9) *Hadena albimacula* (Borkh.), ♂, Folkestone, 24.v.53. (10) *Aporophyla nigra* (Haw), ♂, Folkestone, 17.x.52. A new record for the district. (11) *Luperina testacea* (Schiff.) ab. *obsoleta* Tutt, ♂, Folkestone, 26.viii.52. (12) *Meristis trigrammica* (Hufn.), Folkestone, 19.v.-23.vi.53. A series of 9 varying in colour and pattern. (13) *Eublemma parva* (Hb.), ♂♂, Folkestone, 23 and 25.v.53. (14) *Plusia festucae* (L.), ♂, Folkestone, 26.v.53. (15) *Catocala nupta* L., ♂, hindwings with complete bar and of a deeper red than usual. (16) *Euphyia luctuata* (Schiff.), near Folkestone, ♀, 26.v.53; ♀, 10.vi; ♂, bred, 5.viii. (17) *Nycterosea obstipata* (Fab.), ♂♂, Folkestone, 8.ix.53. (18) *Eupithecia innotata* Hufn., ♀, Folkestone, 30.v.53. "This is not s.sp. *fraxinata* Crewe." (19) *Semiothisa alternaria* (Hb.), ♀, Folkestone, 12.viii.53. (20) *Campaea margaritata* (L.), ♀, Folkestone, 2.ix.53. Second brood. (21) *Opisthograptis luteolata* (L.), Folkestone, viii.53. Four males with reddish bar along costa. (22) *Ennomos autumnaria* (Werneburg), Folkestone, 7. ix.53. A heavily marked male. (23) *E. quercinaria* (Hufn.), Folkestone, viii.ix.53. Four males differing in colour and markings. (24) *Colotois pennaria* (L.), ♂, ab. *castinearia*

Lambill, Folkestone, 19.x.52. (25) *Urocullis elinguaris* (L.), ♂, Folkestone, 16.viii.53. Wings rather heavily speckled. (26) *Evergestis extimalis* (Scop.), ♂, Folkestone, 3.vii.53. (27) *Salebria semirubella* (Scop.), ♂♂, Folkestone, viii.53. (28) *Anerastia lotella* (Hb.), ♀, Folkestone, 21.vii.52. (29) *Nephopterix genistella* (Dup.), ♂, Folkestone, 31.vii.51. (30) *Ancylolomia tentaculella* Hb., ♂, Dungeness, 26.vii.35. (31) *A. palpella* Schiff., ♂♂, Haifa, 5.xi.45; Jerusalem, 1.xi.45, resemble preceding, but antennae pectinated. (32) *Ethmia terminella* Fletcher, two, Romney Marsh, June 1953. (33) *E. bipunctella* (Fab.), two, Romney Marsh, June 1953. (34) *Blastobasis decolorella* Wollaston, ♂, Folkestone, 10.vi.53. (35) *Zygaena filipendulae* (L.), Dungeness, bred, vi-vii.53. 9 specimens, all apparently of s.sp. *hippocrepidis* Stephens.

Mr. D. E. NEWMAN—Lepidoptera:—*Abraxas grossulariata* L., an extreme melanic specimen taken at Wallingford, Berks., August 1953 (Plate III, fig. 6) and *Lycaena phlaeas* L., an ab. *suffusa* B. & L. taken at Staines, Middlesex, August 1952.

Mr. M. NIBLETT—Some rare or uncommon Trypetidae (Diptera). *Chaetorellia loricata* Rond.—Emerged 18.vii.49 from flower-heads of *Centaurea scabiosa*, collected at Epsom Downs, Surrey, 14.vii.49. The food plant of the larva of this species was not previously known. *Ditricha guttularis* Mg.—Emerged 29.vii.53 from galls on roots of *Achillea millefolium*, collected at Lacey Green, Sy., 25.vii.53. *Paroxyna elongatula* Lw.—Emerged 31.viii.49 from flower-heads of *Bidens tripartita*, collected at Bookham Common, Sy., 13.viii.49. *Paroxyna misella* Lw.—Emerged 26.vi.53 from galls on stems of *Artemisia vulgaris*, collected at Epsom Common, Sy., 9.vi.53. *Tephritis cometa* Lw.—Emerged 29.viii.53 from flower-heads of *Cirsium arvense*, collected at Epsom Downs, Sy., 13.viii.53. *Urophora cuspidata* Mg.—Emerged 28.vi.39 from galls in flower-heads of *Centaurea scabiosa*, collected at Burwell, Cambs., 10.xi.38. *Urophora solstitialis* L.—Emerged 20.vi.53 from galls in flower-heads of *Carduus nutans*, collected at Banstead Downs, Sy., 4.ix.52. Many records of this species are incorrect, other species having been mistaken for it.

Cynipidae (Hymenoptera)—Galls of *Andricus* (*Cynips*) *kollari* Htg. a.g. on *Quercus robur*, induced by *Andricus circulans* Mayr, s.g. bred from galls on *Quercus cerris*; this proving that the claim made by Beijerinck in 1902 that they were alternating generations was correct. *A. circulans* were sleeved 20.iv.49, *A. kollari* galls were observed 23.vi.49.

Mr. G. B. OLIVER—Lepidoptera:—*Argynnis paphia* L. ab. *valezina* Esp., two unusual forms, inbred 1953 from a wild specimen of ab. *valezina* taken in 1951. One, set underside, having a large patch of black scaling covering the centre of forewings: the rear wings shaded with russet (Plate I, fig. 3): the other specimen with short tails to rear wings (Plate I, fig. 4). Also a series of female specimens illustrating the range of shades from typical to deep violet-black of *valezina*.

Mr. N. C. PILLEAU—*Polygonia c-album* L., heavily marked with black, W. Sussex, 3.7.48 (Plate II, fig. 2). *Coenonympha tullia* Müll. ab.

*thornensis* Pilleau (type). The only mark on underside is a small apical white spot, Doncaster, 27.6.37 (Plate III, fig. 4). *Colias croceus* Fourc., khaki ♂, Bognor, 1.10.47. ♀, with the normally greenish ground colour of underside, turquoise blue, Bognor, 20.9.47. *Erebia epiphron* Knoch. ♂ without orange band, Ambleside, 25.6.34. *Lycaena phlaeas* L., albino ♂, Folkestone, 22.8.26. *Ulastrina argiolus*, ♀ with spots almost absent, W. Sussex, 19.7.29 (Plate III, fig. 1). *Polyommatus icarus* Rott., ♂, an asymmetrical ab. (Plate III, fig. 3). *Apatura iris* L., 2 females and 1 male of second brood. *Limenitis camilla* L., including a long series of ab. *nigrina* Weym. and ab. *semi-nigrina* Tutt. *Aphantopus hyperantus* L., a long series (7 drawers) from Kent, W. Sussex, New Forest, Cumberland and Aberdeenshire, including abs. *hyperophthalma* Stauder, *vidua* Müller, *goodsoni* Pilleau, *parvi-punctata* Castle Russell, *nigra* Pilleau, *crassipuncta* Burkhardt, *marpurgensis* Strand, *caecimaculata* Pilleau, *arcuata* Zusanek, *infra-pallida* Lempke, *arete* Müller, *caeca* Fuchs, *obsoleta* Tutt, *cabeui* Pionn, *lanceolata* Shipp, *hyperantoides* Strand, *brunnea* Tutt, *minor* Fuchs, and *cuneata* Gillmer.

Major-General A. L. RANSOME—Lepidoptera:—(1) *Maniola jurtina* (L.): July. Examples of abs. *partimtransformis* Leeds, *albicosta* Leeds and *pallidula* Leeds. (2) *Plebejus argus* (L.): A series from Hants. between 2nd and 10th July, showing various aberrations, among others in ♀ uppersides various shades of colour exemplified by *auronulla* B. & L. and *partimtransformis* B. & L., and two examples of blue suffusion on the hind-wings. Other aberrations include ♂ undersides *crassipuncta* Courv. and *parvipuncta* Tutt, and ♀ undersides *costajuncta* Tutt and one example of *costajuncta* and *basijuncta* Tutt combined. (3) *Lysandra coridon* (Poda): from Hants., 25th July to 7th August. ♂ uppersides. ab. *marginata* Tutt, *metallica* B. & L., *ultrafowleri* B. & L., and one colour aberration not classified. ♀ uppersides. *partimtransformis* B. & L. and *punctata* Tutt. ♂ undersides. *albescens-obsoleta* Tutt and *albescens-parvipuncta* B. & L. (4) *Lysandra bellargus* (Rott.): from Hants. and Glos. Four ♀♀ showing on upperside blue suffusion on all wings, two being ab. *ceronus* Esp.; both the latter and one of the former taken in June, the other in August. ♂ undersides similar to ab. *caeca* Courv. of *L. coridon*, and *anticaeca* B. & L. June. ♀ underside similar to ab. *caeca* Courv. of *L. coridon*, August.

Mr. AUSTIN RICHARDSON—Lepidoptera taken or bred, 1952-3:—*Lampra fimbriata* Schr., varied series, bred, Caernarvonshire, with a pink form, Kent and a mahogany form, Glos.; *Peridroma porphyrea* Schiff., a melanic ab., Devon; *Anaplectoides prasina* Schiff., two melanic specimens, Staffs.; *Stauropus fagi* L. ab. *obscura* Rebel, a particularly finely marked specimen with pronounced white cross-lines, Glos.; *Lasiocampa quercus* L., two females from Kent with two bred females of var. *callunae* Palmer, Caern. and three females taken in S. Devon, the Devon specimens being much darker and with more pronounced markings; *L. trifolii* Schiff., two females from Kent, one being of the bandless yellow form; *Callimorpha jacobaeae* L., an ab. with h.w. orange; *Plusia chryson* Esp., bred series with preserved larva, Hants.;



*Maniola tithonus* L., a xanthic ab., Kent; *Coenonympha tullia* Müll. var. *philoxenus* Esp., a series including two heavily spotted abs., Salop.; *Euphyia luctuata* Schiff., long series bred ab ovis from a female taken in Kent, viii.52, with two preserved larvae; *Eulype subhastata* Nolcken, bred series including an ab. with much reduced central spots on f.w., also a preserved larva of the uncommon brown form, apparently present about one per cent. in Wales and Scotland; Caernarvonshire; *Thalera fimbrialis* Scop., short series, Kent; *Alcis repandata* L., series bred from wild Caern. larvae, including five of the semi-melanic form apparently confined to that area; *Ectropis consonaria* Hb., a heavily banded ab., Glos.; *Opisthograptis luteolata* L., three abs. with brown costas, Caern., and one semi-obsolete ab. Glos.; *Agrotis ripae* Hb., long series of the red form, bred S. Devon, with a preserved larva and a series of the white form from Sussex for comparison; *Apatele leporina* L., series from Staffs., including three ab. *melanocephala* Mansbr.; *A. alni* L., series from Glos. and Yorks., including two ab. *steinerti* Caspari; *Chaonia ruficornis* Hufn., a melanic ab., Glos.; *Clostera curtula* L. two Gen. I specimens, Glos. and a pale red Gen. 2 ab., Kent; *Dasychira fascelina* L., series of large males, Kent; *Tethea fluctuosa* Hb., comparative series from Caern. and Glos.; *Apatele rumicis* L. ab. *salicis* Curt., specimens from Glos. and Kent; *Harpyia bicuspis* Borkh., Staffs.; *Polyplocia ridens* Fab., a heavily banded ab., Caern.; *Hada nana* Hufn., two dark abs., Glos.; *Abrostola tripartita* Hufn., a melanic and a semi-melanic ab., Yorks.; *Hadena bicolorata* Hufn. (*serena* Schiff.) an ab. with exceptionally broad central band, Yorks.; *Xylomiges conspicillaris* L., short series from Glos. and Herefordshire, including ab. *intermedia* Tutt; *Orthosia munda* Schiff., an ab. with pronounced white subterminal line on f.w., Glos. (Plate II, fig. 4); *Amathes glareosa* Esp., two extreme specimens of ab. *rosea* Tutt, Caern.; *Ceramica pisi* L., a melanic ab., Staffs; *Laphygma exigua* Hb., three, Devon; *Heliothis peltigera* Schiff., Devon; *Nonagria sparganii* Esp. ab. *bipunctata* Tutt, Kent; *Callophasia lunula* Hufn., a specimen taken in Kent at light, 10.viii.53; *Plusia ni* Hb., 5 males taken at light, S. Devon, 20-3.viii.53; *Hadena lepida* Esp., an ab. with a pronounced central band and pale terminal areas, Kent; *Leucania vitellina* Hb., a series forced ab ovis from a S. Devon female, emerging Jan. 53, with a preserved larva; *Nonagria algae* Esp. (*cannae* Ochs.), a series bred from pupae, Sussex; *Orthosia gracilis* Schiff., series of dark red forms bred from Hants and Somerset, with comparative series from Caernarvonshire (bright red) and Perthshire (salmon-pink); *Agrotis denticulata* Haw. (*cinerea* Schiff. nec Hufn.), a series of dark brown specimens from the Forest of Dean, Glos., with a comparative series of the light brown Cotswold form; *Hadena barrettii* Doubl., bred series from S. Devon and Caernarvonshire, with comparative series from Anglesey and N. Cornwall, the Caern. and Devon specimens being darker and more uniform than the Anglesey and Cornwall specimens, which appear more variegated; *H. conspersa* Schiff., abs. *intermedia* Tutt, *ochrea* Gregs., and *obliterae* Robs., bred over a period of three years from larvae taken in Unst, Aug. 1950; *Diarsia dahlia*



Hb., a series of dark specimens forced *ab ovis* from a Yorks female, emerging Dec. 1952, some of the males being particularly striking with a dark terminal band on f.w., with two preserved larvae.

Mr. B. RIORDAN—The Orthopteron, *Gryllotalpa gryllotalpa* L., from Hertfordshire, July 1953.

Mr. H. S. ROBINSON and Mr. E. W. CLASSEY—Lepidoptera:—(1) Series showing variation in local random samples:—*Arctia caja* Linn. and *Agrochola lychnidis* Schiff, Faringdon, Hants.; *Aporophyla australis* Boisd. and *Plusia gamma* Linn. (Dwarf grey, normal grey, dwarf red and normal red forms), Dungeness, Kent; *Cryphia perla* Schiff., Feltham, Middlesex. (2) Short series of rare migrants and recent additions to the British list:—*Euphyia luctuata* Schiff., Orlestone Forest, Kent, imagines, including aberrant form, and preserved larvae; *Thalera fimbrialis* Scop., Dungeness, imagines forced in October from June ova, and preserved larvae; *Eublemma parva* Hb., Faringdon, Hants. (3) A series of *Spilosoma urticae* Esp., showing the effect of non-bleaching killing agents. Series in two parts comparing insects killed with cyanide (bleached) and tetrachlorethane (unbleached). (4) Aberrant and scarce insects:—*Agrotis segetum* Schiff. (Plate II, fig. 3), *A. puta* Hb. and *Orthosia gothica* L., Faringdon, Hants.; *Hydraecia hucherardi* Mab. (second British record) and preserved larvae and cocoon of *Calophasia lunula* Hufn. (first British record), Dungeness; preserved larva of *Calamia tridens* Hufn. (= *Luceria virens* L.), ex Co. Clare female; *Gortyna micacea* Esp., Lymington, Hants.; *Pheosia tremula* Clerck, Feltham, Middlesex.

Mr. F. RUMSEY—The following Lepidoptera:—*Papilio machaon* L., showing 2 forms from Horning, 1915, and Martham, 5.viii.52; *Pieris brassicae* L., 2 forms of the male from Banstead, 6.vii.53; *Lysandra coridon* Poda ab. *fowleri* South, Boxhill, 30.vii.53; series of *Laothee populi* L., showing abs. from Effingham and Banstead, bred from pupae forced 5.iii.53 to 6.vi.53; *Zygaena lonicerae* von Scheven, dwarf taken, Reedham, Norfolk, 25.vi.52; *Callimorpha jacobaeae* L., abs. bred ex Wilts. stock, 17.vi.53; *Drepana falcataria* L., bred from female taken in light trap, Banstead, 24.vii.53; *Aplasta ononaria* Fuessl., Folkestone field meeting, 27.vi.53; *Geometra papilionaria* L., Esher, bred, 1945; *Hemistola immaculata* Thnbg. (*chrysoprasaria* Esp.), bred, Banstead, 8.viii.53; *Dysstroma truncata* Hufn., bred, Banstead, 17.v.53; and the following, all taken at Banstead with the aid of light trap in 1953, *Pheosia tremula* Clerck, 18.vii, *P. gnoma* Fab., 10.vi, *Pterostoma palpina* Clerck, 25.vi, *Notodonta dromedarius* L., 24.v, *Euphyia cuculata* Hufn., 15.vii, *Orthosia populeti* Fab., 25.iii, *O. advena* Schiff., 5.v, *Agrotis denticulata* Haw. (*cinerea* Schiff. nec Hufn.), 24.v, *Heliophobus anceps* Schiff. (*saponariae* Borkh.), 22.vi, *Heliothis peltigera* Schiff., 26.v, *Hadena bicolorata* Hufn. (*serena* Schiff.), 25.vi, *Plusia iota* L., 1.vii.

Mr. A. D. A. RUSSWURM—Lepidoptera as follows:—*Argynnis euphrosyne* L., five specimens. Two females, one with cream ground

colour, other with black markings greatly reduced. Three males showing variation in black markings. Taken in a Surrey wood, May 1953. *A. selene* Schiff., one female, central area suffused with black, Surrey, June 1953. *Euphydryas aurinia* Rott., nine specimens, showing range of variation. Taken in a Dorset colony during first week of June 1952. Series included two major varieties, one female with cream markings extending to base of wings, the other with uniform orange-brown ground colour, cream markings obsolete. *Lysandra coridon* Poda, eight specimens of various forms of ab. *semisyngrapha* Tutt, taken during first week of August 1953 in Hertfordshire. *Pararge megera* L., two females, one white ground colour to hindwings, other blotched with white on forewings, Hertfordshire, August 1952. *Pyrgus malvae* L. ab. *taras* Berg., taken in Hampshire, June 1953.

Dr. E. SCOTT—The following Lepidoptera taken at light at Westwell, Kent, during the summer of 1953: *Spilosoma urticae* (Esp.), ♂; *Eilema deplana* (Esp.), ♂; *Jaspidia deceptor* (Scop.), ♂; *Leucania straminea* (Treits.) ab. *rufolinea* Tutt; *Euphyia luctuata* (Schiff.), ♂; an aberration of *Meristis trigrammica* (Hufn.) and a melanic aberration of *Sterrhya aversata* (L.).

Mr. T. R. E. SOUTHWOOD—Twenty-one of the more interesting species of Heteroptera collected in the grounds of Rothamsted Experimental Station, Harpenden, Herts., during 1953, including *Neides tipularius* (L.) (Neididae), *Bryocoris pteridis* (Fallen) and *Chlamydatus saltitans* (Fallen) (Miridae), which are additions to the county list.

Mr. K. A. SPENCER—Some additions to the British List of Agromyzidae (Dipt.) bred from leaf mines during the seasons 1952-3:—*Melanagromyza beckeri* Hend. mining *Sonchus asper*, Hampstead, July 1953. *Agromyza albipennis* Zett. mining *Phragmites communis*, Oxford, October 1952. *A. johannae* de Meij. mining *Sarothamnus scoparius*, Hampstead, June 1952. *Phytomyza adjuncta* Her. mining *Pimpinella saxifraga*, Egham, Surrey, August 1953. *Ph. bipunctata* Hend. mining *Echinops bannaticus*, Kew Gardens, June 1953. *Ph. conopodii* Her. mining *Conopodium majus*, Hampstead, May 1952. *Ph. eupatorii* Hend. mining *Eupatorium cannabinum*, Chippenham Fen, July 1953. *Ph. heracleana* Her. mining *Heracleum sphondylium*, Portleven, Cornwall, June 1952. *Ph. matricariae* Hend. mining *Matricaria maritima*, Ugley, Herts., July 1953. *Ph. silai* Her. mining *Silaum silaus*, Egham, Surrey, August 1953. *Ph. tussilaginis* Hend. mining *Petasites hybridus*, Millers Dale, Derby, August 53. *Phytagromyza tremulae* Her. mining *Populus tremula*, Hampstead, July 53. *Liriomyza demeijeri* Her. mining *Artemisia vulgaris*, Hampstead, July 1953. *L. sonchi* Her. mining *Sonchus asper*, Pangbourne, Berks., August 1953.

Mr. W. H. SPREADBURY—Fungi and lantern slides of fungi.

Mr. F. M. STRUTHERS—Specimens of Lepidoptera mostly taken at 1953 field meetings:—*Maniola jurtina* L., Boxhill 26.vii.53, Chipstead 8.viii.53; *Melitaea cinxia* L., Brading, I.O.W., 6.vi.53; *Plebejus argus* L., Folkestone, 27.vi.53; *Parasemia plantaganis* L., Kimble, 31.v.53;

*Diacrisia sannio* L. and *Setina irrorella* L., Folkestone, 27.vi.53; *Hadena bicolorata* Hufn. (*serena* Schiff.), Chipstead, 30.vi.53; *Lygephila pastinum* Treits., Boxhill, 28.vi.53; *Parascotia fuliginaria* L., bred from larvae, Effingham, 20.vi.53; *Aplasta ononaria* Fuessl., Folkestone, 27.vi.53; *Scopula ornata* Scop., Colley Hill, 22.vi.53; *Anaitis efformata* Guen., Chipstead, 19.vii.53; *Euphyia cuculata* Hufn., Chipstead, 30.vi.53; *Anticlea derivata* Schiff., Effingham, 2.v.53; *Bapta bimaculata* Fab., E. Horsley, 16.v.53; *Lomaspilis marginata* L., Oxshott, 18.vii.53; *Abraxas sylvata* Scop., Boxhill, 5.vii.53; *Procris geryon* Hb., Kimble, 31.v.53; *Aegeria chrysidiformis* Esp., Folkestone, 27.vi.53.

Mr. H. D. SWAIN—(A) European Orthoptera:—A small collection of Mantids and Grasshoppers mostly showing cryptic colours when at rest and conspicuous colours when flying. They were taken in France and Switzerland during the summers 1947-1949. Most of the species inhabit mountainous districts, or the rocky country near the Mediterranean. (B) Lepidoptera:—*Aglais urticae* L. An unusual variety taken at Buckler's Hard, in the New Forest, on 5th July 1953. "It is unlike many forms of this species in that the white subapical spot on the forewing is almost entirely suppressed, and in that there is no yellow colour anywhere on any wing. The central black spots of the forewing are also absent." (Plate I, fig. 2.) (C) Coloured drawings of Insects. (1) Larvae of British Moths. "The three species of larvae illustrated are all drawn from living specimens which have been bred during the 1953 summer season. The two Pine Hawk caterpillars were the offspring from a female taken at the Oxshott Field Meeting held on 18th July 1953". (2)-(4). Exotic Papilionidae. "The drawings of five species of Indo-Australian Papilionidae were the result of experiments to see the results of using different kinds of paper and paints. It may, on the whole, be said that the use of designer's colours, including body colour, seems to give the most satisfactory result as far as brilliance is concerned".

Miss VERE TEMPLE—Water-colour drawings as follows:—Lepidoptera: (i) *Saturnia pavonia* L., a bred ♀ which assembled a wild ♂, April 1952, at Tollard Royal, Wilts., also two larvae and ova-cluster which resulted from that pairing. (ii) *Cerura vinula* L., with larvae, found Bournemouth, 1951-1952. Orthoptera: (i) *Metrioptera brachyptera* L., ♂, found Canford Heath, September 1953; (ii) *Pholidoptera griseoaptera* Deg., ♂ and ♀, found Tollard Royal, July-August 1953. (iii), (iv) and (v) Male, female, and paired *Leptophyes punctatissima* Bosc. found Tollard Royal October 1951 and 1953. (vi) *Chorthippus parallelus* Zett., September.

Mr. J. E. THORPE, see Dr. N. L. BIRKETT.

Mr. D. THORPE-YOUNG—Lepidoptera:—(1) A short series of *Plebejus argus* L. taken at our Folkestone Field Meeting, 27.vi.1953. "This race would appear to be larger than the usual form." (2) *Maculinea arion* L. taken North Cornwall, July 1947, including a dwarf specimen. (3) A series of *Melitaea cinxia* L. taken at our Isle of Wight Field Meeting, 6.vi.1953. (4) A series of *Coenonympha pamphilus* L. showing various

aberrations—mostly caught on the Downs at Banstead, Surrey. (5) A short series of *Maniola tithonus* L. showing two different races.

Mr. RALPH TUBBS—Lepidoptera:—*Polyommatus icarus* Rott. Results of breeding from ♀ ab. *arcuata* Weymer (entire brood exhibited), showing various confluent forms in the F1 generation. These aberrations include abs. *arcuata*, *costajuncta* Tutt and *basijuncta* Tutt, either separately or in combination. With few exceptions, the confluent forms are restricted to the ♀♀. cf. R. A. FISHER and E. B. FORD, 1929, "The variability of species in the lepidoptera, with reference to abundance and sex." *Trans. ent. Soc. Lond.*, 76: 367—a paper emphasizing the greater variability of the female sex.

Mr. H. G. TUNSTALL—Lepidoptera:—*Hyloicus pinastri* L., bred from Surrey wild larvae, June 1953. *Rhyacia simulans* Hufn. taken at Ewell, Surrey, on buddleia, July 1949. Probably the first Surrey specimen, see 1952, *Ent. Rec.*, 64: 203. *Panolis flammea* Schiff., greenish-grey variety bred from Oxshott, Surrey, larvae, May 1951. *Abraxas grossulariata* L., a variety with black striation on the right forewing, taken wild at Ewell, August 1953. *Sterrrha muricata* Hufn. taken in Surrey, July 1953.

Prof. G. C. VARLEY—A Caddis-fly recently added to the British List:—"Agrypnètes crassicornis McLachlan (Trichoptera, Phryganeidae) was added to the British list by Dr. Kimmins in 1952 (see Kimmins, *Ann. Mag. nat. Hist.*, (12), 5: 1039-43) on the basis of a single male submitted to him by Mr. P. F. Holmes taken at Malham Tarn, Yorks., on 23rd June 1950. The species was previously known from Finland, the Caucasus and Mongolia. The specimens exhibited were found on 7th July 1953 on the walls of the boat-house at Malham Tarn, or under stones by the shore. They are at once distinguished from other British Trichoptera by their very pale colour and their size. The males have narrower wings and stouter antennae than the females."

Mr. S. WAKELY—(1) LEPIDOPTERA:—(a) A series of *Parasemia plan-taginis* L. bred from North Yorks. stock. The series included ab. *hospita* Schiff., several females with pale hindwings, others with very dark hindwings, and one specimen with deep orange, almost red hindwings. (b) Species obtained during 1953, including the following:—*Hemaris fuciformis* L. (bred, Bookham, Surrey); *Dasychira fascelina* L. (Chobham, Surrey); *Lasiocampa quercus* L. var. *callunae* Palmer (N. Yorks.); *Spilosoma urticae* Esp. (bred, Dymchurch, Kent); *Eilema pygmaeola* Doubl. (at light, Dungeness, Kent); *Anaplectoides prasina* Schiff. at m.v., woods near Barham, Kent); *Hadena compta* Schiff. (at m.v., Whitfield, Kent); *Eremobia ochroleuca* Schiff. (bred, St. Margarets Cliff, Kent); *Colobochoyla salicalis* Schiff. (bred, Ham Street, Kent); *Aplasta ononaria* Fuessl. (S.E. Kent); *Sterrrha vulpinaria* H.-S. (*rusticata* Schiff. auctt. nec Schiff.) (N.W. Kent); *Entephria caesiata* Schiff. (bred, N. Yorks.); *Hydrelia flammeolaria* Hufn. (Betchworth, Surrey); *Euphyia unangulata* Haw. (at m.v., woods near Barham); *Eupithecia extensaria* Freyer (bred, Spurn, Yorks.); *E. fraxinata* Crewe (bred, Dymchurch);

*Euzophera ceratoniae* Zell. (bred, larva in shop walnut); *Euenadophorus rhododactyla* Schiff. (bred, S.E. Essex); *Whittleia retiella* Newm. (Benfleet, Essex); *Phalonia alismiana* Rag. (bred, Horsley, Surrey); *P. gilvicomana* Zell. (bred, Boxhill, Surrey); *Cacoecia aeriferana* H.-S. (at m.v.; near Barham); *Laspeyresia leplastriana* Curt. (bred, Folkestone, Kent); *L. coniferana* Ratz., *L. pactolana* Zell., and *L. cosmophorana* Treits. (Horsell, Surrey); *Gelechia hippophaella* Schrank. (bred, Sandown, Kent); *Platyedra vilella* Zell. (bred, Slades Green, Kent); *Phthorimaea tricolorella* Haw. (bred, Eynsford, Kent, and Tandridge, Surrey); *Blastodacna stephensi* Staint. (Tooting Common, London); *Mompha nodicolella* Fuchs (bred, Ockham, Surrey); *Blastobasis lignea* Wals. (bred, Boxhill, Surrey and Eynsford, Kent); *B. decolorella* Woll. (Dulwich, London); *Depressaria cnicella* Treits. (bred, Sandown, Kent); *Hyponomeuta evonymella* L. (at m.v., Whitfield, Kent); *Ethmia terminella* Fletch. (Lydd, Kent); *E. decemguttella* Hb. (bred, Dorset); *Lithocolletis comparella* Zell. (bred, Tooting, London); *Leucoptera susinella* H.-S. (bred, Aviemore, Scotland); *L. lathyrifoliella* Staint. (bred, Luccombe, Isle of Wight. (c) Some species taken at m.v. in garden at Camberwell during August 1953, including: *Notodonta dromedarius* L., *Cosmia diffinis* L., *C. affinis* L., *Atethmia xerampelina* Esp., *Eupithecia succenturiata* L., *E. icterata* Vill., *E. sobrinata* Hb., *Deuteronomos fuscantaria* Steph., *Acentropus niveus* Ol., *Euzophera pinguis* Haw., *Phycita betulae* Goeze, *Crambus contaminellus* Hb., *Evetria purdeyi* Durr., *Pammene juliana* Curt., *Prays curtisellus* Don. var. *rustica* Haw., *Ypsolophus alpellus* Schiff., *Bucculatrix cristatella* Zell. (2) ODONATA:—*Sympetrum flaveolum* L. (Sandown, Kent, 1953). (3) COLEOPTERA taken during 1953:—*Orchesia undulata* Kr. (Effingham, Surrey); *Arhopalus fesus* Mulsant (Osborne, Isle of Wight); *Baris laticollis* Mm. (Folkestone, Kent). (4) DIPTERA:—*Oncodes gibbosus* L. (Chailey, Sussex, 1953).

Mr. D. H. WALKER—Lepidoptera captured in Surrey, Sussex and Kent during 1953:—*Pararge aegeria* L., two melanic ♀♀, "both have the forewing upperside yellow markings 'smoked' over; one specimen has completely dark hindwings apart from the white eye spots, the other specimen is similar but still retains the central yellow spot." *P. megera* L., a ♀ upperside with an additional spot above and below apical spot on both forewings. *Plebejus argus* L. race *cretaceus* Tutt, a ♀ ab. *anti-obsolete-post-caeca* B. & L. *Coenonympha pamphilus* L., a ♂ showing homoeosis; "on the underside is a streak of bright orange forewing marking stretching across the right hindwing". *Lysandra bellargus* Rott., a ♂, "possible *Polyommatus icarus* Rott. × *L. bellargus* hybrid shown as an underside. The right hindwings are of the normal size and colouring for *bellargus*, but the left-hand wings are considerably smaller and of the normal size for *icarus* from this locality. The left-hand hindwing consists of two ground colours, the forward half being of the same colour as the forewing, the rear half is very much darker and spots are elongated. The break occurs along the central nervure which splits at its extremity and causes two separate

marginal outlines giving the effect of a halfwing superimposed on the hindwing". *Euchloë cardamines* L., a ♂ "gynandromorph with yellow orange tips and the black (including that on antennae) replaced by buff". *Argynnis euphrosyne* L., a ♀ ab. similar to fig. 3, plate 65, "Butterflies of the British Isles", R. South. *A. selene* Schiff., a ♂ upperside with white markings on all four wings.

Mr. NORMAN A. WATKINS—Varieties of butterflies: (1) *Pieris napi* L., a series inbred from a partially banded ♀ taken July 1952 by Mr. A. Valentine in Somerset (♂ parent unknown; a selection from F1, F2 and F3 broods; the F3 brood shown is F1 × F2). It is noteworthy that selective pairing is possible owing to the ♂♂ being banded on the underside. It also seems possible that the underside banding of ♀♀ is an independent factor from that of the upperside. This tendency is noticeable in several cases. Forms shown included abs. *confluens* Schima, *postero-maculata* Rev., *conjuncta* Verity, *latecincta* Mull., etc. (2) *Papilio machaon* L., a dark ♂ with usual yellow powdered yellow scales to marginal black bands of forewings absent; also blue scales on hindwings almost entirely absent. Bred 1953, Norfolk. (3) *Nymphalis io* L., blind and melanic forms, including ab. *belisaria* Obth., bred from wild larvae, Wilts., 1953. (4) *Agapetes galathea* L., an extreme ♀ ab. *valentini* Williams from Somerset and both sexes transitional to this aberration from Dorset, all 1953. (5) *Maniola jurtina* L., a ♂ ab. *costatransformis* Leeds (right forewing) and a ♂ with golden-white patch on left forewing. (6) *Eumenis semele* L., a ♀ ab. showing absence of normal orange and buff markings, particularly on hindwings, and great excess of dark scaling, from Wilts., 1953. (7) *Plebeius argus* L., a ♀ ab. *radiata* Obth., Dorset, July 1953, and a series from what is believed to be a hitherto undiscovered locality in mid-Somerset, July 1953. (8) *Polyommatus icarus* Rott., a curious ♂ underside probably referable to ab. *ultra-confluentiae* B. & L., Dorset, July 1953. (9) *Lysandra bellargus* Rott., 2 ♂ ab. *anti-caeca* B. & L. and a very extreme ♀ ab. *flavescens-virgatus* B. & L., all spring brood, Wilts., 1953. (10) A long series of named aberrations of *Lysandra coridon* Poda, from Somerset, Dorset and Wilts., 1953, and an example of Homoeosis; a ♂ with streaks of upperside blue scaling on underside of right hindwing, and in addition patches of black or dark-brown scaling towards the edge of the costa and margin of the same wing, Dorset, 26th July 1953.

Mrs. N. I. WATSON—Lepidoptera:—*Dasychira pudibunda* L., a series bred from a pair found in cop. by Mr. L. Stimson at Ashurst. "Part of the brood emerged in November 1952, the others in June 1953. Further breeding is being continued." *Panaxia dominula* L., various forms. *Lasiocampa quercus* L., a series from Bradford including a thinly scaled female. *Zygaena filipendulae* L., two from Shawford Downs.

Mr. H. E. WEBB—Lepidoptera (Rhopalocera):—*Maniola tithonus* L., four bleached specimens, ♂♂ and ♀♀, from Hants., Surrey and Middlesex. *M. jurtina* L., six specimens, ♀♀, from New Forest, S.



Cornwall and N. Devon, including spotted forms. *Aglais urticae* L., five specimens, ♂♂ and ♀♀, from Middlesex, Herts., Freshwater and Kincardine, varied forms including ab. *polaris* Stgdr. *Lysandra coridon* Poda, seven specimens, ♂♂, ab. *latiora* B. & L., from Royston; ab. *ultra-punctata-margino* B. & L., from Sussex; ab. *pallidula-infralavendula-fowleri* B. & L., from Dorset; ab. *syngrapha-inframarginata* B. & L., from Princes Risborough; ab. *obsoleta* Tutt (underside), from Royston; ab. *discojuncta* B. & L. (underside), from North Kent, and ab. *I-nigrum* Tutt, from Princes Risborough.

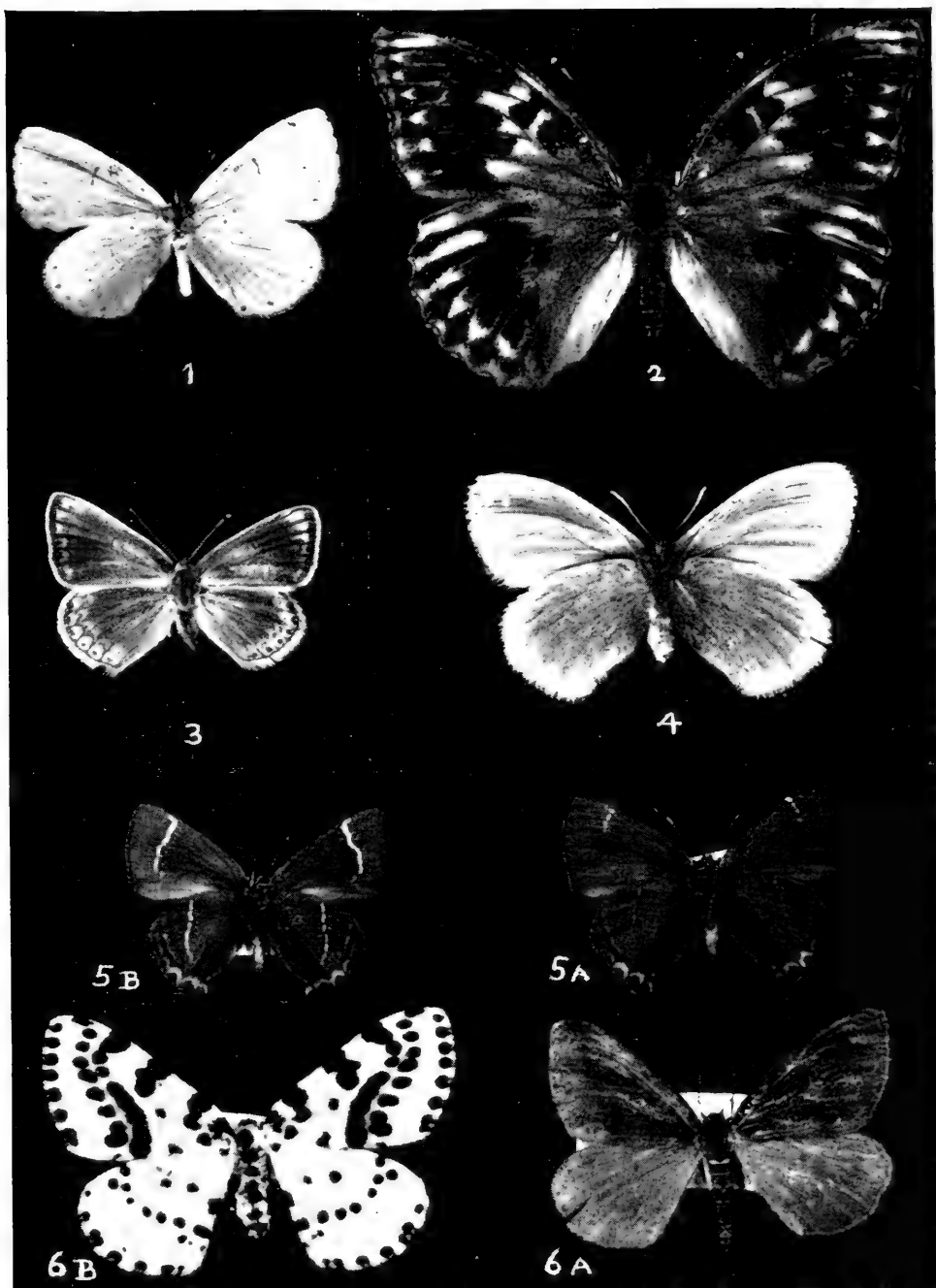
MESSRS. BERNARD B. WEST and KENNETH E. WEST—Lepidoptera:—*Apatura iris* (L.) ab. *iole* Schiff. and a water colour painting of the underside. "This specimen, exhibited with three normal forms—male, female, and male underside, was bred from a pupa found in one of the large Northamptonshire oakwoods. Actually the *iole* pupa was taken just over the border in neighbouring Buckinghamshire, the county boundary running through the wood. The pupa was found at a height of about 12 feet from the ground on a small Sallow, on 25th June 1948, and the butterfly emerged 2nd July 1948. The form is not the most extreme that can occur, but the white band on the hindwings is almost entirely absent; the illustration shows how this appears on the underside."

MR. G. F. C. WOOLLETT—Lepidoptera taken in Surrey:—(1) *Plebejus argus* L., a selection of various aberrations showing a series of gynandromorphs or inter-sexes, a series of blue females and a long series of female undersides ab. *post-radiata* B. & L., series of male uppersides and undersides showing the variation in colouring including two very striking pale blue specimens suffused with dark scales on uppersides of all four wings, all taken this season (1953). (2) *Lysandra bellargus* Rott., an interesting male of a dark shade.

BARON DE WORMS—(A) RHOPALOCERA:—A series of *Melitaea* (*Euphydryas*) *aurinia* Rott. bred from a locality near Carlisle showing heavy forewing markings. Emerged May 1953. (B) HETEROCERA:—Taken and

#### EXPLANATION OF PLATE III.

- Fig. 1. *Celastrina argiolus* L. ab. underside. Mr. N. C. Pilleau.  
 Fig. 2. *Argynnis paphia* L. ab. similar to that figured by Frohawk (*Nat. Hist. Brit. Butt.*, p. 64, fig. 20). Mr. K. E. J. Bailey.  
 Fig. 3. *Polyommatus icarus* Rott. asymmetrical ab. Mr. N. C. Pilleau.  
 Fig. 4. *Coenonympha tullia* Mull. ab. *thornensis* Pilleau, type, underside. Mr. N. C. Pilleau.  
 Fig. 5. *Strymonidia w-album* Knoch (a) ab. *butlerowi* Kroul and (b) typical for comparison. Mr. K. E. J. Bailey.  
 Fig. 6. *Abraxas grossulariata* L. (a) melanic ab. and (b) typical for comparison. Mr. D. E. Newman.



*Photos. 1, 3 & 4, W. H. T. Tams; 2, 5 & 6, K. E. J. Bailey and D. E. Newman.*

Annual Exhibition : 31st October 1953.





bred during 1953. Series of the following: (1) *Eriogaster lanestris* L., bred, from Hunts. (2) *Odontosia carmelita* Esp., from Surrey and Scotland. (3) *Clostera curtula* L., from Horsell. (4) *Tethea ocularis* L., from Horsell. (5) *T. fluctuosa* Hb., from Tilgate. (6) *Dasychira fascelina* L., from Horsell, at light. (7) *Panaxia dominula* L., from Salisbury, bred. (8) *Apatele aceris* L., from Horsell. (9) *Apamea unanimitis* Hb., from Woodwalton Fen. (10) *Gynsitea leucographa* Schiff., from Witherslack. (11) *Jodia croceago* Schiff., bred, from Ham Street, Kent. (12) *Anarta cordigera* Thnbg., from Aviemore. (13) *Plusia bractea* Schiff., from Aviemore. (14) *Bomolocha crassalis* Fab. (*fontis* Thnbg.), from New Forest. (15) *Trichopteryx polycommata* Schiff., from Witherslack. (16) *Oporinia christyi* Prout, from Ranmore Common, Surrey. (17) *Chloroclystis debiliata* Hb., from New Forest. (18) *Isturgia carbonaria* Clerck, from Aviemore. (19) *Selenia tetralunaria* Hufn., from Newtonmore, Scotland. (C) Aberrations and scarce species of British LEPIDOPTERA taken and bred during 1953: (1) *Colias croceus* Fourc. ab. *helice* Hb., a specimen with very little marking in the border, Folkestone. (2) *Pyrgus malvae* L., a short series taken at Eastbourne, including ab. *taras* Berg. and intermediate forms. (3) *Arctia caja* L., a specimen of ab. *consolidata* Cockayne with the brown markings on the forewings joined to form a large round area, Surrey, July. (4) *Achlya flavicornis* L., a very dark and suffused example, Surrey. (5) *Dasychira pudibunda* L., male with deep grey forewings, Surrey. (6) *Apatele rumicis* L., with very variegated forewings, Surrey. (7) *Agrotis exclamations* L., three specimens with heavy fascia on forewings, Horsell. (8) *A. clavis* Hufn. (*corticea* Hb.), a male with black border to forewings, Horsell. (9) *Apamea furva* Schiff., two dark examples from Aviemore. (10) *A. monoglypha* Hufn., two very melanic examples from Newtonmore, Scotland. (11) *Amphipyra pyramidea* L., a very dark specimen from Ham Street, Kent, August. (12) *Dicynela oo* L., two specimens from Woking, Surrey. (13) *Orthosia gothica* L., two suffused forms, ab. *gothicina* H.-S. from Scotland and an albinistic example from Surrey. (14) *Eustroma reticulata* Schiff., a short series taken in the Lake District, July. (15) *Euphyia luctuata* Schiff., a short series taken in Kent in August. (16) *Sterrhia dimidiata* Hufn., an example with heavy circular band on all the wings, Horsell. (17) *Dysstroma truncata* Hufn., three melanic specimens from Sheffield, June. (18) *Crocallis elingvaria* L., a suffused male from Surrey. (19) *Selenia lunaria* Schiff., two males from Horsell, Surrey. (20) *Boarmia roboraria* Schiff., a melanic male from Horsell, June. (D) 60 species of butterflies taken during a visit to Kenya, Uganda and Tanganyika during November and December 1952. Including Papilionidae, Pieridae, Nymphalidae, Satyridae and Lycaenidae.

MR. GEORGE H. YODEN—LEPIDOPTERA:—A series of *Oria musculosa* Hb., from Wiltshire, 1953. A series of *Selenia lunaria* Schiff., bred from a female taken at Herne Bay, Kent, 1953. A specimen of *Harpyia biscuspis* Borkh., and five *Apatele alni* L., from Sussex, 1953. A series

of *Trichopteryx polycommata* Schiff., bred from Dover, 1953. A specimen of *Abraxas sylvata* Scop. ab. *pantarioides* Spitz., bred from a female taken at Dover, 1952. A series of *Alucita galactodactyla* Schiff., bred from larvae taken in Surrey, 1953. Odonata:—A specimen of *Sympetrum flaveolum* L. taken in a mercury vapour light trap at Dover on 30th June 1953.

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11th November 1953.

The PRESIDENT in the Chair.

Mrs. Helen Howarth, F.R.H.S., and Major B. C. Barton, O.B.E., were declared elected members.

#### EXHIBITS.

BARON DE WORMS—Larvae of *Ortholitha umbrifera* Prout (Lep., Hydrimenidae) from the Forest of Dean, Glos.

Mr. F. D. BUCK—A short series of *Anthocomus rufus* Herbst (Col., Malachiidae) taken at Sutton Broad, E. Norfolk, 7th September 1953, where they were common. Although all specimens had been de-greased, the elytra showed a variation in colour from bright red to pitchy with the humeri and apex somewhat lighter. This latter form is easily mistaken in the sweeping net for *Cerapheles terminatus* (Mén.) which occurs equally commonly in exactly the same spot earlier in the year.

Mr. G. C. D. GRIFFITHS—Two species of Agromyzidae (Dipt.) new to Britain, with corresponding mines:—(1) *Phytomyza ranunculivora* Hering, taken at Beaconsfield, Bucks., 6th September 1953, on *Ranunculus* sp. Imagines emerged 25-28th September. (2) *P. scabiosae* Hendel, taken at Chipstead, Surrey, 8th August 1953, as pupae off *Scabiosa columbaria* L. (Dipsacaceae). Imagines emerged 11th August.

Mr. T. G. Howarth—A series of *Phlogophora meticulosa* L. (Lep., Caradrinidae) showing both the brown and the green form, some of both forms having a decided pinkish flush to the ground colour. A wild example of *Arctia caja* L. (Lep., Arctiidae) taken on 25th October 1953, representing a second brood. A wild *Perizoma bifasciata* Haw. (Lep., Hydrimenidae) taken 19th October 1953, possibly belonging to a second brood. All the specimens were taken in a mercury vapour trap at Arkley, Herts.

Mr. L. W. SIGGS—A living specimen of the second brood of *Arctia caja* L.

Mr. D. LESTON—A collection of Pentatomoidea (Hem.) from Burma, collected by Dr. R. Malaise (Riksmuseet, Stockholm) in 1934 and now in course of determination by the exhibitor. One of them, *Stibaropus callidum* Schiodte, has all three pairs of legs strongly modified for digging and has vestigial tarsi.

## COMMUNICATIONS.

At the recent annual exhibition Miss C. A. McDermott showed a specimen of *Nymphalis xanthomelas* Esp. (Lep., Nymphalidae) taken in Kent on 2nd July 1953. Apparently this is the first British record of this Central and Southern European relative of *N. polychloros* L. Mr. T. G. Howarth showed by means of the epidiascope paintings of both species and explained the differences thus: "In *xanthomelas* the forewings are more angulate, with a brighter red-brown ground colour. The spots are generally slightly larger and darker. The marginal lines are more diffuse and the submarginal band is broader on both fore and hindwings. The apical area of the forewing has a white patch situated between the band and the outer costal spot; this is yellowish in *polychloros* and is therefore not so contrasting. The mid and hind legs of *xanthomelas* are yellowish brown and contrast sharply with the body-hairs, whereas *polychloros* has legs of the same shade of brown as the body-hairs. The larvae of *xanthomelas* are gregarious and feed on *Salix caprea*, *vitellina* and *glauca*, and according to Seitz have 'a preference for the twigs that overhang the water'. They have a distinct black dorsal line bordered on either side with yellow. Their spines are black, while those of *polychloros* are yellow. The nearest locality to Britain from which we have specimens in the British Museum is Berlin."

There was a discussion on the annual exhibition.

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25th NOVEMBER 1953.

The PRESIDENT in the Chair.

Rear Admiral A. D. Torlesse, R.N., C.B., D.S.O., and Messrs. W. L. Coleridge, C. F. Coxon, C. L. Nissen, C. F. Rivers, B. R. Stallwood, J. L. P. Wallis and B. B. West were declared elected members.

Mr. C. P. ROSE, A.R.P.S., M.B.O.U., showed a colour film, "Tetlar (Shetlands) in June".

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9th DECEMBER 1953.

The PRESIDENT in the Chair.

## EXHIBITS.

BARON DE WORMS—*Sterrhia aversata* L. (Lep., Sterrhidae), a melanic example taken in a mercury vapour trap at Westwell, near Ashford, Kent, by Dr. E. Scott, on 30th July 1953, and presented to the National Collection at Tring.

Mr. S. N. A. JACOBS—Proofs of the first eight plates for a second edition of Beirne, Bryan P., 1952, *British Pyralid and Plume Moths*.

Mr. B. K. WEST—Male specimens of *Colotis antevippe* Boisduv. (Lep., Pieridae) and of *C. pallene* Hopffr. and *C. evippe* Godt., taken at Bulawayo, Southern Rhodesia, February-June 1948.

Mr. D. W. THORPE-YOUNG—A collection of butterflies from Japan.

## COMMUNICATIONS.

During the recent spell of abnormally warm weather the following Lepidoptera had been seen:—*Nymphalis io* L. (Nymphalidae), *Vanessa atalanta* L. (Nymphalidae), *Gonepteryx rhamni* L. (Pieridae), *Phigalia pilosaria* Schiff. (*pedaria* F.) (Selidosemidae) on 2nd December at Dorking, Surrey, and *Biston strataria* Hufn. (Selidosemidae) at the same place, 7th December.

Col. N. HUDSON read a paper, illustrated by the lantern, "Early Entomology, Solomon to Columbus".

13th JANUARY 1954.

The PRESIDENT in the Chair.

The deaths of Dr. J. A. Walker and Col. P. A. Cardew were announced.

Mr. David B. Atty, B.A., was declared elected a member.

## EXHIBITS.

BARON DE WORMS—(1) *Agrochola circellaris* Hufn. (Lep., Caradrinidae), a very pale form, (2) *Oporinia dilutata* Schiff. (Lep., Hydrimenidae), heavily fasciated examples, all taken in a mercury vapour trap at Woking, Surrey, October 1953.

Mr. F. RUMSEY—A fasciated twig of *Viburnum lantana* L. (Caprifoliaceae) from Tadworth, Surrey.

Mr. S. N. A. JACOBS—Water colour drawings for Plates 13 and 14 of a second edition of Beirne, Bryan P., 1952, *British Pyralid and Plume Moths*.

Mr. T. R. EAGLES—Fruiting specimens of *Bryum argenteum* L. (Moss) from Bayford, Herts.

Lantern slides were shown by BARON DE WORMS and Mr. W. H. SPREADBURY.

27th JANUARY 1954.

## 82nd ANNUAL MEETING

(with which was combined the Ordinary Meeting).

Mr. F. STANLEY-SMITH, F.R.E.S., President, in the Chair.

Reports of the Council and Treasurer were read and adopted.

The following members were declared elected as Honorary Officers and Council for the ensuing twelve months:—*President*—S. N. A. Jacobs, S.B.St.J., F.R.E.S. *Vice-Presidents*—F. Stanley-Smith, F.R.E.S.; E. E. Syms, F.Z.S., F.R.E.S. *Treasurer*—J. L. Henderson. *Secretary*—F. T. Vallins, A.C.I.I., F.R.E.S. *Editor*—T. R. Eagles. *Curator*—F. J. Coulson. *Librarian*—D. Leston, F.Z.S., F.R.E.S. *Lanternist*—F. D. Buck. *Ordinary Members of Council*—E. W. Classey,

F.R.E.S.; A. E. Gardner, F.R.E.S.; T. G. Howarth, B.E.M., F.Z.S., F.R.E.S.; B. P. Moore, B.Sc., Ph.D., F.R.E.S.; J. L. Newton, M.R.C.S., L.R.C.P.; F. Rumsey; K. A. Spencer, B.A., F.R.E.S.; H. D. Swain, M.A., F.R.E.S.; S. Wakely; H. E. Webb, F.R.E.S.

### PRESIDENT'S ADDRESS.

27th JANUARY 1954.

Read by Mr. F. STANLEY-SMITH, F.R.E.S.

The time has nearly come for me to shed the responsibilities that you laid on me a year ago, but before I do so one last duty remains, an ordeal which deters many members from assuming the office I now hold. This is sometimes grandiloquently described as "delivering the Presidential Address", in itself a sufficiently frightening phrase. But I must proceed with it.

We have just heard what was described as the Council's Report. Of course, it is really written by our hard-working Secretary; the Council simply alters a word here and there, and then filches it as its own. It does not make bad reading. It shows that on the whole we have had an uneventful year, marked only by an interesting development towards the end. Membership still remains round about the 500 mark. The recent rises in subscription rates have cost us a number of members, but fortunately the benefits we offer have attracted equal numbers to counterbalance. In December the Nature Conservancy asked us, amongst others, to compile reports for them on the insects to be found in areas throughout England in which they are interested. By reason of the response received from members to the circular letters we sent out we have undertaken to do so for an experimental period. I do hope that by the combined efforts of members we shall build up worth-while reports, useful to the Conservancy and ensuring also to the benefit of the Society. There are distinct possibilities that entomologists in the areas being worked will join us in order to take part, and this may serve as the impetus to get us away from the 500 mark.

Fortunately the Treasurer's report is not so uneventful. Four years ago we had accumulated £181, gradually saved up over the 78 years of the Society's existence. In the next two years all but £41 of it vanished, £103 in 1950 and £37 in 1951. Fortunately the rot was stopped in 1952, when we just came out all square. This year we have reaped the benefit of the last rise in subscription rates, and made sufficient excess to restore our balance to £221, which puts us better off than we were four years ago. The Treasurer deserves our thanks for insisting on the unpalatable necessity of raising subscriptions before our growing expenses landed us in "Queer Street". We must be on our guard that our reserves do not vanish again.

The Editor has had a worrying year. He has been struggling all the while to get the coloured plates completed for the 1952-53 Proceedings,

and even now they are not ready. Unfortunately there was just nothing much that could be done to speed things up. We are very much in the hands of the printers in such matters.

The Curator's report, of course, does not make thrilling reading, but without talking about it, that officer puts in long hours constantly organising and re-arranging our collections. These get bigger and bigger, and so take up more and more time. He has been ably assisted by Mr. Gardner with the Odonata, while Mr. Vallins, not having enough to do as Secretary, has been busy arranging the Lycaenidae presented by the Rev. B. P. Murray, adding many specimens from his own extensive collections to make the series more completely representative.

The Librarian has done well in weeding out books for which we could not afford house-room, and in disposing of them has raised a surprising amount of money. This, of course, does not count as income, but is earmarked for re-spending on the library itself.

It now behoves me to mention the four members whom we lost by death during the year, as indicated in the Council's report. They were Major Noel Thomas, and Messrs Bostock, Ensor, and Priest.

Mr. C. G. Priest died in 1952, but the news did not reach us till 1953. The little man joined us in 1924. Although he has always lived in West London, he used to attend meetings regularly for a time, then disappear for a spell and come back again. He always used to sit at the back of the room, and it was amusing, but never annoying, when his voice would suddenly break forth during a silence. He collected lepidoptera only; was always glad to be given early stages to rear, and occasionally exhibited the results.

Mr. E. D. Bostock of Folkestone, an elderly man, died in the early part of the year. In his younger days he had been an ardent collector of lepidoptera, but seems to have given it up in his middle years, resuming it as a solace after he lost his wife. He joined us in 1945 on the recommendation of his friend, Mr. Hugh Newman. The first portion of his collection of British lepidoptera was sold by auction in October. He came regularly to our Annual Exhibitions, but very seldom to other meetings.

Major Noel Thomas, M.B.E., a comparatively young man interested in lepidoptera, was introduced by Miss McDermott in 1950. Unfortunately we saw very little of him.

Mr. G. A. Ensor I first knew many years ago as a fellow member of B.E.N.A., when we used not infrequently to meet in the New Forest. He knew the lepidoptera well, but specialised in the parasitic hymenoptera preying on them. He joined the "South London" in 1935, and in the old days at Hibernia Chambers used to attend meetings fairly regularly, exhibiting occasionally. Of late years we saw him but seldom. I understand he was painfully ill for a long time before he died in June.

We have already once stood in memory of the departed as their loss has been announced, so I will not ask you to do so again.

It has been suggested to me that, in view of my long acquaintance with the inner workings of the Society, I ought before I fade out to write its history so as to get it on record in narrative form. As I was completely at a loss for a subject to talk about to-night, I decided to adopt the suggestion, and to read it (in part) as my address to-night. I already held a good deal of documentary material belonging to the Society, including the old minute books, the earliest account book, and old exhibition notices. The late Mr. H. J. Turner before he died transferred all he could lay hands on, chiefly old press cuttings. The story of the early days of the Society has been written and published at least twice before, first by Robert Adkin as part of his Presidential Address in January 1908, and second by Edward Step, read by Dr. Blair in lieu of his Presidential Address in January 1932. For the genesis of the Society, despite the fact that he was admitted to membership within four months of its inception, whereas Adkin did not join till 10 years later, Step drew on Adkin. I, too, must draw on the same source, together with the documents mentioned.

### THE HISTORY OF THE "SOUTH LONDON" SOCIETY.

**ANTECEDENTS.** As Adkin tells us, The Entomological Club, which had been in existence since 1826, possessed an extensive collection of insects, which, in the early 1870's, was housed by that well-known entomologist and writer Edward Newman, one of its eight members, at his residence, 7 York Grove, Peckham. The rule of the Club was that the collection had to be open for inspection by any entomologist one evening in each week. Newman used to announce the dates and times of his "Evenings at Home" from time to time in the *Entomologist*, the journal which he had founded and was still editing. The only qualification he required from his visitors was a genuine interest in Entomology.

**THE BEGINNING.** It was at these meetings that the idea of forming an entomological society or club for South London was conceived. Four gentlemen, whom Adkin described as conspirators, Messrs. J. Platt Barrett, J. G. Marsh, T. H. Hoey, and W. West of Greenwich, met at Barrett's house, 34 Radnor Street, Peckham, and, at the second meeting (attended also by four more, Messrs. C. J. Boden, G. C. Champion, A. F. Cowley, and another), it was agreed to inaugurate the "South London Entomological Society", to enroll members, and to seek a meeting place. The eight "conspirators" were afterwards regarded as Founder Members. The identity of the eighth cannot now be established. The position of Edward Newman also in the hierarchy is not clear. In the first of the members' list he is shewn as enrolled as an ordinary member on 3rd April 1872, the subscription spaces thereafter being endorsed "Patron". He is also shown third on the list of "Patrons".

**PATRONS.** The Patrons in order of entry were Sir John Lubbock, Bart., afterwards Lord Avebury, Mr. H. T. Stainton, Mr. Edward Newman already mentioned, Mr. R. McLachlan, and Mr. E. C. Rye. In January 1887 Lord Walsingham and Mr. J. W. Dunning were added. Under the revised bye-laws as passed in 1891 the five then surviving Patrons became "Honorary Members". It is a pity that the



only one of them to sign the Obligation Book was Mr. McLachlan. This book was presented by Mr. Gibb on 22nd March 1888, and brought into use forthwith.

**DATE OF FOUNDATION.** Although the first signature in the Obligation Book, that of W. West of Greenwich, is dated 20th March 1872, those following being dated a week later, the first subscription book shows the first 11 members as all entered on 27th March 1872, so that date must be considered as the birthday of the Society.

**FIRST OFFICERS.** At the first quarterly meeting, on Wednesday, 19th June 1872, Mr. J. R. Wellman was elected President, Mr. J. Platt Barrett Honorary Secretary, and Mr. J. G. Marsh Honorary Treasurer, with a Council of five members.

Step, in his account, tells us that about that time he himself saw a paragraph in the "South London Press", the local paper of those days, announcing the formation of the Society and inviting all interested to a meeting upon a certain Thursday. He attended, with two other youngsters, strangers to him and to one and another, was interviewed by the Secretary, approved, entered for membership and was admitted on 3rd July 1872. Thus for many of us he is a link stretching right back to the beginning.

Turning to more recent times, towards the end of 1944 the Council elected Mr. H. J. Turner as its first and, so far, the only Honorary Life President of the Society in recognition of his pre-eminent services. As later paragraphs will show, Mr. Turner joined the Society in 1877, became Report Secretary in 1893, and virtually continued in that office till 1935. He was also President in 1916 and 1917. In 1918 the office of Honorary Editor of "Proceedings" was added to his other duties. In 1935 he was made an Honorary Member and was presented with an album containing the signatures of as many members as it was possible to collect. After his death in 1950 that album was handed over to the archives.

**MEMBERSHIP.** Mr. F. D. Coote's graphs accompanying his Presidential address in January 1942 show how the number of members had varied up to that time. It steadily rose for the first seven years to a total of 90; but then continual moves of meeting place, coupled, so Adkin tells us, with differences of opinion over the support given by some members to a National Entomological Exhibition at the Royal Aquarium, led to a drop to 44 in 1883. Thereafter there was a rapid rise till 200 was reached in 1889. The first world war brought an inevitable drop, but ever since then the membership has steadily increased, reaching 300 in 1945, 400 early in 1947, and 500 in 1951. The actual membership at 31st December 1953, was 515. Up to that date there had been in all some 1623 members, this number not including some 40 who had been elected but had not taken up membership.

**DEVELOPMENTS.** In March 1881 a general meeting decided to bring other branches of Natural History within the scope of the Society. At a further meeting in April an attempt to change the name failed, but

in March 1884 the name was changed to the present one—The South London Entomological and Natural History Society.

In January 1888 the *Entomologist* published an article by Mr. Coryndon Matthews advocating the formation of a new entomological society for country members, with headquarters in London. Other letters followed which showed that there was a general desire among country collectors for communication and intercourse with more advanced entomologists. In April a letter from Mr. Matthews to the Society prompted the appointment of a committee to arrange an extension of country membership. A code of rules was drawn up offering special facilities and advantages to country members studying any branch of biology, and a special letter was devised to be sent to all applicants for country membership. Mr. Carrington, then its Editor, undertook to draft an article for the *Entomologist*. The result was that Mr. Matthews and 15 others including one lady, joined the Society. Several of them very quickly took advantage of one of the special facilities offered, the identification of their specimens. An attempt to raise the subscription for Country Members from 2/6 to 5/- p.a., presumably because of the extra benefits, failed.

On 25th January 1894 a photograph album was presented by Mr. Jenner Weir. In 1898 another was presented by Mr. T. W. Hall. Many of the photographs of members therein are named and we are trying to identify the remainder.

**SOUTH LONDON CABINET CLUBS.** As off-shoots of the Society two Cabinet Clubs were run in the early years. The rules of the first show that it started in February 1886. Its object was to enable members to buy cabinets by instalment payments. The entrance fee was 2/-, and the subscription 2/- a week. As soon as the accumulated funds reached £15 a ballot took place to decide which subscriber was entitled to the next cabinet. This he was authorised to order in the name of the Club. If his order cost more than £15 the subscriber paid the excess to the cabinet maker. An agreement had to be signed by the subscriber that the cabinet remained the property of the Trustees of the Club till he had paid up his full £15. Fourteen members subscribed. Apparently it did not run too well, as one of the subscribers, writing in 1894 about the winding up of the second club, said he had lost a considerable sum of money in an earlier one.

The rules and objects of the second Club were very similar. It started in February 1890, but it also ran into difficulties due to lax record keeping. There were 19 subscribers, 8 of whom got cabinets, and the others had their subscriptions, as accurately as they could be ascertained, returned to them by July 1894. Receipts filed show that a Gurney 30-drawer mahogany cabinet in 1890 cost £18, a Brady 30-drawer one "with cornice" £16 5s 0d, and a 40-drawer one £20.

**PREMISES.** From the original meetings in Mr. Platt Barrett's house in Peckham, quarters were first found in the reading room of Dunn's Institute in Newington Causeway, S.E. By the end of the first year this was inadequate for the meetings. A friend of Step's then allowed

the Society to meet in the dining room of his house in West Square for some time, till new rooms were found and ready at an Assembly Rooms at 104 Westminster Bridge Road, S.W. These proved satisfactory for the next six years. The next move was to the South London Temperance Hall near the Surrey Theatre in the Blackfriars Road, S.E., where the Society was meeting in 1879; then, in July 1880, to a room at 94 New Kent Road (near the Elephant & Castle). Step tells us that the house had a long front garden which took it so far back from the pavement that the door was in darkness and the number could not be seen. In consequence members failed to find the meetings, which grew smaller and smaller and no doubt would have come to an end, had not a few members given a mutual undertaking to attend every time unless prevented by illness. We were there till 1884, when on 5th June we moved to a room at the "Pride of St. George's" Coffee Tavern and Restaurant, 60 Blackman Street, Borough, S.E. According to Step this was the most distinctly entomological place we have occupied, as our orthopterists could always rely upon getting a series of the small cockroach, *Blatta germanica*, in all stages climbing the walls of the meeting room. As might perhaps be imagined, we had to beat a hasty retreat from this place on getting word that the bailiffs were about to take possession. Emergency arrangements had to be made, and the cabinets and bookcase belonging to the Society were housed by a member. Fresh quarters were found with the Southwark Liberal and Radical Association at their committee rooms, 1 Denman Street, Railway Approach, London Bridge Station, S.E., at a rental of 7/6d per night. The constant shifting had seriously affected the Society adversely, but this last removal appeared to instil fresh life, and membership steadily increased. However the rent was increased against us, and in view of the uncertain tenure, it was decided in January 1887 to accept the offer of a suite of rooms in the Bridge House Hotel, London Bridge, at a rental of £12 12s 0d per annum. These were actually held under an agreement duly executed and stamped. Nevertheless Step tells us that the place was in such great demand for concerts, balls and banquets, that we never knew till we reached there whether we should meet in the ballroom or the bar-parlour. The legal agreement did not stop our new landlords giving us notice to quit in June 1889. An active and influential committee towards the end of the year got an offer of accommodation from the Home and Foreign Produce Supply Association Limited (afterwards called the London Produce Exchange Limited) in their premises known as Hibernia Chambers at the south-west side of London Bridge, at £25 p.a. with small extras. This offer was accepted, and we moved in early in 1890. There we stayed for a great many years. The rent was raised from £25 to £50 with effect from 1st January 1924, but we still stayed on. In 1939 the Exchange were reconstructing premises on the opposite side of the road, and we assumed that when they moved across that we should move with them. It came as a sudden shock when they told us they would not have us. In this emergency the Royal Entomological Society of London very kindly offered us accommodation

in their premises at 41 Queen's Gate, S.W.17, for our meetings and our collections. This we accepted, putting our library into store. The outbreak of the second world war found us still without a home of our own, but by November we had fixed up with the Chapter of Southwark Cathedral to house our library and collections and to hold our meetings in the Foster Hall of the Chapter House, in St. Thomas's Street, S.E. This arrangement lasted for the duration of the war, when a new Provost wanted the entire use of the premises and we had to clear out. At this time our traditional part of London was in a state of partial ruin after all the bombing, and an active and energetic committee could find no suitable meeting place anywhere near London Bridge. Our explorations were extended further afield and we were fortunate in invoking the sympathy and assistance of no less a body than The Royal Society. Without delay they allowed us to start to hold our meetings in their Apartments at Burlington House, W.1, and though they could not arrange for our library and collections to be accessible for some months they housed them for us meanwhile. Our first meeting in their rooms was on 13th June 1945. Removal was completed on 23rd July. Early in 1946 we were authorised to arrange our collections and library in two rooms in the basement, to be shared with the Quekett Microscopical Society, and on 13th March the collections were again open for reference, followed by the library on 10th April.

The Bright Collection of British Blues, left to the Society in 1941, was housed by the Hope Department of Entomology at Oxford University for the remainder of the war, and was brought to London and added to our collections on 24th April 1946.

Although some doubts were felt as to whether it was right to leave South London for the glitter and the dangers of the West End, and although the more sumptuous premises possibly contributed to making our meetings more formal and less friendly than of yore, we have gradually settled down and hope it will be long before we suffer another upheaval. Just occasionally The Royal Society has functions which prevent our using their premises on our regular dates. On such occasions we nearly always find that the Linnean Society of London will let us use their premises across the quadrangle.

**MEETINGS.** Originally the Society met on alternate Thursdays at 8 p.m. On removal in 1884 the dates were changed to first and third Thursdays in the month, the new rooms only being available on those days. On 16th December 1886 this was changed to second and fourth Thursdays, to avoid clashing with the Linnean Society of London which met on first and third Thursdays. This rule seems to have persisted unchanged right up to the first world war, throughout which meetings continued regularly in unbroken sequence, the only alteration being that in the winter of 1916 meetings were started at 7 p.m. instead of 8 p.m. After the war 7 p.m. became the regular meeting time.

In July and August of 1939, having lost our home of many years, we held our two meetings a month in the premises and by the courtesy

of The Royal Entomological Society of London. With the outbreak of the second world war in September no meetings were held after 24th August till 4th November, when, having found a new home of our own, we started to meet again once a month at 2.30 p.m. on Saturday afternoons. An experimental meeting in the crypt of the Chapter House on Thursday 23rd November 1939 at 5 p.m. was not repeated. From the beginning of April 1940 till the end of August we resumed two meetings a month, then the Battle of Britain caused another break till October when we resumed meetings once a month. This practice continued unbroken till April 1945, the Exhibition being held as the October meeting, and the Annual Meeting towards the end of January being additional to the Ordinary Meeting earlier that month. These meetings were on Thursday evenings in the summer, and on Saturday afternoons in the winter. In May 1945 we resumed two meetings a month, on Thursdays at 6.30 p.m. The next month, on removing to Burlington House, we altered the days of our meetings to second and fourth Wednesdays, as the regular meeting day of The Royal Society is on Thursday, still at 6.30 p.m. That arrangement continues to the present day.

In the 1880's even our ordinary meetings were regularly reported in the local press, as shown by cuttings filed in the archives.

**FIELD MEETINGS.** These have naturally been a prominent feature of the Society's programme from very early days. The first programme of such meetings on record is in 1883, when four meetings were arranged and held during the season—to Loughton, Box Hill, Ashted, and Seven-oaks. In 1926 on 13th May, all field meetings were cancelled till further notice owing to the general strike.

A much esteemed member, Mr. R. W. Attwood, actually died while leading a meeting at Oxshott on 20th July 1941.

**EXHIBITIONS.** According to press reports of opening speeches at later dates the first Exhibition was held within a year of the Society's formation. Others were held annually for a few years, then dropped till 1883. The first one appears to have been a pocket-box exhibition, and to have attracted three times as many members, and three times as many exhibitors as the similar one held in October 1883, which had only 21 exhibitors. A similar exhibition was held in November 1884.

The first of the exhibitions on record as open to the public was the "Annual Exhibition" staged in the Society's Rooms at 1 Denman Street, on the evening of 3rd December 1885. This, according to the report in the South London Press, the local paper of those days, attracted a very large attendance of the public. The exhibits were drawn from all branches of Natural History, particularly of course the Insecta, but also including Mammalia, Aves, Arachnida, and Mollusca, with botanical specimens and microscopical subjects. Many of the last exhibits were contributed by members of the South London, and Quekett Microscopical Societies. The success of this exhibition was attributed by the President,

Mr. Richard South, to the organising ability and enthusiasm of Mr. Robert Adkin, and these two names recur with frequency throughout the records of the Society for the next forty years.

In the following year (1886) a similar exhibition was arranged in the ballroom and adjacent rooms hired at the Bridge House Hotel, London Bridge, for the evening of 25th November. The printed programme gives an alphabetical list of 84 exhibitors in addition to the Zoological Society of London, which sent specimens of exotic lepidoptera. According to press reports, close on 1200 people attended during the two hours the exhibition was open. It was reported at varying lengths in the *Daily Chronicle*, *Daily News*, *The People*, *The South London Press*, and the *Kentish Mercury*. This show cost the Society £9 3s 10d; 350 circulars, 600 tickets, and 1500 programmes were printed.

By 1887 the Society had moved into the Bridge House Hotel, and the whole of the available space in the house was hired for the Exhibition on the evening of 16th November. 1200 superficial feet of table space was provided. Again the exhibits were drawn from almost all biological orders, the most noteworthy being a vast collection of Lycaenidae from the whole of the South-Eastern district, as well as from the Continent. Another was a large table covered with Fungi collected near Esher by two members two days before. Numerous microscopes were set up. The Scioptron Company put on a lantern show. The printed programme shows that pianoforte music was played during the evening. Despite one of the worst fogs of the month, about 1000 visitors attended.

In 1888 the effort was still more ambitious and more successful. The same rooms were hired for two successive evenings, the first for a private view at a charge of 1/-; the second free. 100 posters were used to advertise the "private view". On the first evening over 400 people paid for admission, on the second the attendance was estimated at about 1400. There were 100 exhibitors, many of them showing in more than one class. A manuscript description of the exhibits is in the Society's archives. Lectures were given on the first evening, and slides shown on the second; music was played on both. Financially there was a profit of 2/9 to the funds. The event was reported at some length in the *Daily Telegraph*, *Daily Chronicle*, *Daily News*, in the *Standard* on both evenings, *Scientific News*, *The City Press*, *The South London Mail*, the *Kentish Mercury*, and *The People*. Reproduction of these reports are printed as Appendix B.

Similar arrangements were carried through in 1889 for what is described in the press as the "Tenth Annual Exhibition" on 30-31 October, except that on the second day the exhibition was open from 2-4 p.m. as well as from 6-10 p.m. in the evening. A copy of the poster is in the archives. The afternoon opening was a success in that the rooms were not then crowded, permitting a close and leisurely inspection of the exhibits. The total attendance was estimated at 2200. Cuttings are filed from the "*Daily News*", "*Pall Mall Gazette*", "*Pall Mall Budget*", "*City Press*", "*South London Press*" "*South London Mail*" and "*Kentish Mercury*".



The next "Annual Exhibition", on the same lines except that on the second day it was open continuously from 1 p.m. to 10 p.m., was held on 15th and 16th April 1891. It was described in the Secretary's report as the most successful to date. Expenses were heavier, so that the guarantors were called on to meet a part; only £1 7s. 6d. was charged against Society's funds. The cover of the printed programme is reproduced as Appendix C.

In 1892 a similar Exhibition was held on 5th and 6th May as shown by a programme filed. A full report appeared in "Nature" on 12th May. Again a small loss was incurred.

In 1895 St. Martin's Town Hall was hired for a one-evening exhibition on Thursday, 17th October. Members were allowed one free ticket, but had to pay 1s. each for all others. The printed programme gives the names of 70 exhibitors in all branches of Natural History. There were lectures by Mr. Enoch on Insect Architects and Dr. Cooke on Fungi. Music was rendered on piano, violin, and vocally. 322 tickets were sold; the guarantors were called on to make up a small balance of expenses. This was the last of the great exhibitions, and the first to be fully reported in our "Proceedings". A copy of the poster advertising this exhibition is reproduced here as appendix D.

It was by then realised that the limit of novelty and, in consequence, of interest, had been reached, and no further exhibitions on anything approaching the same scale have been held since.

Instead, in 1896 it was arranged that the Ordinary Meeting on 26th November should be devoted to an exhibition of varieties. This first meeting, which followed the normal pattern of ordinary meetings, members exhibiting and explaining their exhibits in turn, drew a large attendance, 17 exhibitors, and was reported in the usual way in the "Proceedings".

Similar exhibitions, progressively each more successful than the last, were held in 1898 (November 10th), 1900 (November 8th), 1901 (November 28th), 1902 (November 27th), 1903 (November 26th), 1904 (November 24th), and 1905 (November 23rd).

On Saturday 10th March 1906 a large general Natural History exhibition was staged, occupying the whole of the Society's rooms at Hibernia Chambers, open from 5 until 10 p.m. A printed programme was issued in advance. Lecturettes illustrated by the Society's lantern were given at frequent intervals in the Council room by six members. Tea was served in the library between 5 and 8 p.m. by Mrs. Robert Adkin. This show was fully reported in the "Proceedings".

The special "Exhibition of Varieties" thereafter continued to be held every year up to 1923 inclusive, not excluding the years of the first world war, as the second November meeting, except in 1916 and 1917 when it was held as the December meeting. 27th November 1924, seems to have been the last time the words "of Varieties" were used in referring to the Annual Exhibition. In 1924 an innovation was made, the exhibits not being passed round as they had hitherto been, but after presentation to the President being laid out on side tables. In

1925 this change went further, the exhibits simply being laid out on tables, while another innovation was the provision of refreshments by the President Mr. Grosvenor, and Mr. O. R. Goodman. In 1926 a fund was collected to meet the cost of refreshments, and this practice continued for a number of years. In 1927 the date of the Annual Exhibition was changed from the second November meeting to the second meeting in October, with the idea of avoiding the foggy season. For the remainder of our stay in Hibernia Chambers, that is up to 1938 inclusive, our "Annual Exhibition" continued on this basis. It became a red-letter day in the entomological year in this country. Exhibits were laid out on tables occupying more than half of the large open hall, with a refreshment buffet set up by caterers, and chairs spread about at the other end.

With the loss of our home in 1939 and the outbreak of war, we were unable to hold any meetings in the autumn, so a report was compiled by Mr. S. G. Castle Russell of the insects that would have been shown could the exhibition have been held in that year. This was published in *The Entomologist's Record* as well as in the "Proceedings". In 1940 it was felt that members would not risk bringing their most valuable captures of the year into London, so the same arrangements were carried out, an ordinary meeting being held instead on the exhibition date. In 1941 the series was resumed in the large Hall of the Chapter House, 37 exhibitors and 116 attendances being recorded. Similar arrangements prevailed in 1942, 1943 and 1944. In the last two years refreshments were provided by members and the Society, and served by lady members and friends. By the autumn of 1945 we were installed in Burlington House, and on 27th October of that year our first exhibition was held on those premises. It more than filled the upstairs library of The Royal Society. Accordingly, in the following year the upper library of the Geological Society of London was also borrowed, the two libraries being contiguous with communicating doors. Light refreshments were provided by an outside caterer at the expense of the Society. Similar arrangements applied for 1947 and 1948. In 1949 the experiment was tried of calling specially for exhibits from particular Orders or Groups other than Macro-lepidoptera, to wit Micro-lepidoptera, Coleoptera and Hemiptera. This produced some interesting exhibits, so the plan has been continued since; the "other orders" in turn being Neuroptera for 1950, and Hymenoptera and Diptera for 1951. From 1951 it became necessary to charge for the refreshments owing to the financial stringency of the Society.

**ANNUAL DINNERS.** Records of the earlier ones are very scanty. The first mention that can be found is in the Council's Report for 1891, which nevertheless refers to the Annual Dinner as having been held at the Bridge House Hotel on 12th January, when members spent a pleasant evening, for which they thanked the Dinner Committee. In 1892 it was held on 9th February, and the Dinner Committee thanked the members and friends who so ably assisted in carrying out the musical



and other arrangements. In 1893 it was held at the Bridge House Hotel on 2nd March, and was "as usual" most successful. Tickets sold realised £8 10s., while the expenses were £8. In 1894, on 1st March, at Bridge House Hotel, receipts just balanced the cost at £8 5s. In 1895 at Bridge House Hotel, on 26th February, tickets realised £6, but the dinner cost £6 5s. Perhaps this serious deficiency explains why we hear of no further dinner for many years!

In 1922 a Supper was held on 19th October, with a pocket-box exhibition, at the Holborn Restaurant, to celebrate the 50th Anniversary of the foundation of the Society. On a cost of £31 17s. 6d. this made a profit of 10s. Mr. Robert Adkin, as the oldest member present, presided, and 75 members and former members and their friends, including a founder-member, Mr. G. C. Champion, were present. Musical entertainment was provided.

The end of the Second World War was marked by a Re-union Supper at the Connaught Rooms in January 1946. Two members who had been prisoners of war in the Far East, Messrs. T. G. Howarth and W. H. Storey, were entertained as official guests; the third of them, Mr. G. C. Stubbs was unable to be present. Officers of The Royal Society were also present as guests. In all 99 members and friends enjoyed a pleasant evening.

The success of the Supper inaugurated a new series of Annual Dinners, held on Friday evenings on the eve of the Annual Exhibition, starting with 1946. At these dinners have been entertained in turn representatives of many of the leading entomological societies of this country, as well as other guests.

The series has been as follows:—

<i>Year.</i>	<i>Venue.</i>	<i>Guest Society.</i>
1946.	Pimms, Bishopsgate.	The Royal Entomological Society of London.
1947.	Pimms, Bishopsgate.	London Natural History Society.
1948.	Frascati's.	Lancashire & Cheshire Entomological Society.
1949.	Charing Cross Hotel.	Folkestone Natural History Society.
1950.	Charing Cross Hotel.	Birmingham Natural History & Philo- sophic Society.
1951.	Connaught Rooms.	Linnean Society of London.
1952.	Holborn Restaurant.	Raven Entomological Society.
1953.	Holborn Restaurant.	Amateur Entomologists Society.

The total number attending these dinners has varied from about 80 to 135.

**RULES.** The first cash book shows that as early as June 1872 copies of the rules were being sold to members at 4d each. The earliest rules that can be traced are contained in a leaflet filed in the archives, the cover of which is reproduced here as Appendix A. By 1876 they had been modified to provide for the formation of a typical collection as well as the

library mentioned in the first rules, while the first subscription had to be for at least six months instead of three months as in the earlier rules. The 1876 rules were printed with the report for 1879, and again in 1881.

In 1884 the change of name (adding "& Natural History") was embodied in the rules, and the object was altered from the diffusion of "Entomological" to "Biological" Science. In December 1885 allowance was made for two Secretaries. In 1886 Presidents were debarred from holding office for more than two consecutive years. In January 1887, in anticipation of the move to the Bridge House Hotel, it was resolved at the Annual Meeting that no refreshments or smoking should be allowed in the Society's rooms. So far as can be traced, that resolution has never been expunged.

In December 1887 a committee was set up to revise the rules, and their proposals were adopted at a Special Meeting on 9th February 1888. Generally speaking they improved the machinery for the conduct of the Society's business. The radius for "Corresponding Members" was raised from 20 to 30 miles. The rules were printed at the beginning of the Proceedings for 1888 and 1889. On 26th April 1888 additional facilities were approved for "Country Members", the new name for those previously called "Corresponding Members".

Difficulties continually arose under those rules, so a new set of bye-laws was drafted by a member, amended by the Council, and with a few further modifications adopted on 22nd October 1891. These must have been printed as a separate, as they are not included in the Proceedings at this time. The length of continuous service of the President was limited to one year. This set of rules was evidently more successful than the previous one, as with minor alterations it lasted till 1929.

On 10th November 1904 the rule regarding the length of service of the President was again altered to two years. On 23rd January 1913 the office of Honorary Editor of Proceedings was created, with a seat on the Council, effective from 1st January 1913. At the same time the number of Ordinary Members of Council was raised from 7 to 9 to prevent a preponderance of officers thereon.

In 1929 a review was undertaken by an *ad hoc* committee, and on 23rd May 1929 the revised Bye-laws were approved and adopted. They were printed as a supplement to the Proceedings for 1928-29. A similar review, to bring them into line again with then existing practice, was approved and adopted on 23rd October 1946, the revised Bye-laws again being printed as a supplement to the 1946-47 Proceedings. In these rules, the merits of those who had been members continuously for 50 years was recognised by making them "Special Life Members". Shortly after it was discovered that comparatively slight further amendments thereto might make it possible to get exemption from Income Tax on the Society's investment income. The changes were adopted at a Special Meeting on 23rd July 1947, and did in fact lead up to the desired result. Since then the only changes have been in subscription rates.

## SUBSCRIPTION RATES.

Operative Date.	Entrance Fee.	Annual Subscription.		Life Composition.
		Ordinary.	"C"	
27- 3-1872		6d p.m.		
?	1/-	6/- p.a.	2/6	£3- 3-0
10- 4-1885	2/6	7/6	"	£5- 5-0
9- 2-1888	"	"	"	"
22-10-1891	"	"	5/-	"
1- 1-1912	"	10/-	"	£6- 6-0
1- 1-1924	"	12/6	7/6	£8- 8-0
1- 1-1949	7/6	£1- 1-0	12/6	£14-14-0
1- 1-1953	"	£1-11-6	£1-1-0	£21- 0-0

"C" = Corresponding Members up to 1888 = Country Members thereafter

On 9th December 1915 the Treasurer was given power to suspend the subscriptions of members serving in the armed forces for the period of the first world war. On 10th February 1940 the subscriptions of members serving in the second world war were remitted, any paid by members called up before 1st April 1940 to be refunded. On 1st January 1946 permanent members of the armed forces had to resume payment of subscriptions; while temporary members had to do so from the time of release from the forces.

BEQUESTS. These were referred to in the Treasurer's report for 1937. The first was a legacy of cabinets, books, etc., from Mr. W. J. Ashdown. Duplicate books, and the cabinets, which the Society could not then accommodate, were sold, realising £77 12s 1d. At about the same time the Society sold various items, such as cabinets, previously acquired, so the Treasurer concluded that the £24 11s 0d thereby realised was a supplementary result of the same bequest.

In 1922 it was reported to the Society that the late Mr. Lachlan-Gibb had left £200 to the Society "as an appreciation of a life's pleasant and instructive fellowship with the members". The money was received late in 1924.

In 1924 it was announced that the Misses Chapman had given £300 in memory of their brother, the late Dr. Chapman. The money had to be invested to provide for the cost of the Transactions, primarily by the addition of plates.

In December 1931 we received the proceeds of Major Lisle's £50 legacy, actually £44 13s 3d after paying legacy duties.

Towards the end of 1935 we received a £200 bequest from Mr. Robert Adkin.

Since the Treasurer's report referred to above was written, we have received, in June 1941, £100 bequeathed by Miss Fountaine.

PUBLICATIONS. The earliest printed matter brought out by the Society was undoubtedly the four page pamphlet describing the objects of the Society, giving its meeting place and the name of its officers, with a copy of the rules, as already mentioned. (See Appendix A). The first regular publication was the "Report & Balance Sheet for 1876"; the only known copy is in the possession of the Essex Field Club.

The same applies to 1877. Nothing is known for 1878. From 1879 to 1884 there was printed each year a booklet containing the Council's Report, accounts, list of members, library list, and the President's Address, with the rules added in the odd years. On 1st October 1885 the Council decided to extend the printed annual report into the form of "Proceedings and Transactions", commonly spoken of herein as the Proceedings. Accordingly the 1885 issue dropped the library list and the rules, but included reports of the ordinary meetings and the papers read thereat. It extended to 48 pages. In 1886 there appeared the first plate, drawn and lithographed by F. W. Frohawk and printed by West, Newman & Co. In 1887 there were two plates, one by F. W. Frohawk, the other by W. A. Pearce. The next volume covered both 1888 and 1889. It was described as "Published by the Society with the assistance of the following gentlemen"; then followed the names of 26 members. The meaning of that somewhat cryptic notice was not that the gentlemen named had done the editorial work, but that they had financed the publication to a substantial extent. Throughout our history we frequently read that publication had to be held up because there was not sufficient money in the funds. An appeal then had to be made to members for help. And the appeal was never in vain. Similar lists appeared year after year up to as late as 1936-37.

Despite financial stringency and increasing costs since those days, the high standard attained by our publication has been improved, and coloured plates have been added in most recent years. This has only been possible through the generous assistance received at the hands of The Royal Society, very gratifying to us as showing the scientific value that they attach to some of our work. From the Parliamentary Grant-in-aid for Scientific Publications administered by a Committee of that Society we have received grants of £125 towards the cost of the 1945-46 Proceedings, including the coloured plates; a like amount, supplemented later by a further £150 for 1946-47; £120 for 1947-48 and 1948-49; £50 for 1949-50, £45 for 1951 and £140 for 1952-53.

The first coloured plates, two illustrating Dr. Kettlewell's paper on *Panaxia dominula* L., appeared in part 1 of the 1942-43 Proceedings. In 1944-45 appeared the first two of a series of papers by our experts dealing in detail with British Micro-lepidoptera, each illustrated by a coloured plate depicting imagines of all the species dealt with. This series continues to the present day. Extra copies of the coloured plates are being filed with a view to reproducing the series of papers in book form when a sufficiently large block has been covered.

In general there has been one volume to a year, but occasionally the practice has varied. In addition to 1888-1889, 1890-1891 and 1892-1893 were each in one volume. On the other hand 1897 and 1898 were each published in two parts, as were 1941-42 and 1942-43.

One copy of each volume is issued free to each member, who can also purchase extra copies on reduced terms as compared with the published price.

By 1946 Mr. L. T. Ford, assisted by Mr. S. N. A. Jacobs, Mr. S. Wakely and other members, had prepared the text for *A Guide to the Smaller British Lepidoptera*. He granted the Society the right to publish the work, provided that his son, Mr. R. L. E. Ford, should have the right to reprint after the first 1,000 copies had been sold. The Royal Society granted £100 from the Parliamentary Grant-in-Aid of Scientific Publications towards the cost of publication. 1,000 copies were printed. There was no free issue.

**LIBRARY.** The acquisition of a reference and lending library was begun as soon as the Society was inaugurated. It has been steadily built up ever since by purchase, by exchange, and by gifts from members and others, as recorded in the Annual Reports. It contains long runs of the Entomological journals published in this country and elsewhere; publications of Societies and institutions both here and abroad with which we are on exchange terms; and most of the standard reference books on British entomology, with many on other branches of Natural History. Unfortunately the Society, like many others of its kind, suffers from having no spacious home of its own, and this necessitates weeding out the less useful books from time to time. It is to be hoped that an up-to-date catalogue will one day be prepared and printed for the benefit of members.

**COLLECTIONS.** The Society's own collection of insects was commenced in the very early days, and has been added to by members every year since. Its first cabinet, of 40 drawers, was received in April 1880, and by the end of that year a very fair collection of macro-lepidoptera and many rare and local Tortrices and Tineinea were already in hand and being arranged by the Curator. In 1881 the Coleoptera section was taken in hand while, with the extension of the Society's objects to other branches of Natural History, a large collection of dried botanical specimens was promised. These were presented by Mr. Carrington during the next year. By 1882 the cabinet had been laid out to embrace the other Orders of the Insecta, and Neuroptera had been added, while the herbarium was steadily growing.

It is impossible in the space available to record subsequent progress from year to year; this has been adequately dealt with in the published Annual Reports; only complete collections and the most noteworthy acquisitions can be mentioned here.

In 1890 Mr. Alexander Gibb presented a 60-drawer cabinet from Canada; this enabled the Curator to increase substantially the space available for each Order. In 1895 the South London Microscopical Society ceased to exist, and passed their collection of Lepidoptera over to the Society. In 1896 the extensive collection of plants made by our late member, Mr. W. H. Tugwell, was acquired and presented by Mr. C. A. Briggs. This was known as "The Tugwell Herbarium". It was overhauled by Mr. Step from 1906 onwards, and a case to house it was presented by Mr. Robert Adkin in 1911. Eventually it got into a bad state, and had to be scrapped for want of space. In 1897 Dr.

Malcolm Burr presented an almost complete collection of British Orthoptera. In 1909, a collection of Palaearctic butterflies, made by Messrs. Freeman and Leman, in 2 16-drawer cabinets, was presented by Mrs. Freeman at the instigation of Mr. Rowland-Brown, F.E.S., the Secretary of the Entomological Society of London. In 1919 a very useful lot of Micro-lepidoptera collected by the Rev. C. R. Digby was presented by his brother, Admiral Digby, and was amalgamated with the existing collections. In 1920 the collections of "other Orders" was augmented from the W. J. Ashdown bequest.

In 1929 through the kindness of Col. F. A. Labouchere, the Society was presented with 2 40-drawer and 3 20-drawer mahogany cabinets containing the collection of British and Palaearctic Lepidoptera formed by the late Mr. J. J. Lister, F.R.S. Till room could be found for them, they were temporarily housed by Lord Rothschild in his private museum at Tring. In 1930 the "Gibb" 60-drawer cabinet was disposed of, and the Lister cabinets and contents brought to our rooms. The Society's collections of Macro-lepidoptera were amalgamated with the Lister collection. In 1931 work was continued with the Micro-lepidoptera, and this was completed in 1932. A handsome gift of specimens from the authorities of the Natural History Museum then practically completed the Society's collections of those families.

In 1933 Dr. N. H. Joy presented his collection of Coleoptera, arranged in accordance with his recent book, in a 26-drawer cabinet. This was received from the British Museum in the following year.

In 1935 we received a collection of microscope slides, principally of entomological dissections, under the will of our late member, Mr. Rayward of Eastbourne. In 1936 the collection of Hymenoptera made by our late member, Mr. G. E. Frisby of Gravesend, was presented by his widow.

In 1941 an outstanding bequest was the "Bright Collection" of British "Blues", *Lysandra coridon* Poda, *L. bellargus* Rott. and *Polyommatus icarus* L., left by our late member, Mr. Percy Bright of Bourne-mouth. For greater safety this was housed for the duration of the war in the Hope Department of Entomology, University Museum, Oxford, thanks to the kindness of Professor Hale Carpenter, D.M., M.B.E. It was a condition of the bequest that the collection should be kept intact, and on getting it to our new rooms in 1946 the two cabinets in which it was housed were suitably and permanently labelled.

In 1942 our member, Mr. H. A. Leeds of Wood Walton, unconditionally presented a long and varied series of the 3 British "Browns", the 3 Satyrids, *Maniola tithonus* L., *M. jurtina* L. and *Coenonympha pamphilus* L., together with a manuscript describing the aberrations. His descriptions were eventually published in our 1948-49 "Proceedings".

In 1943 our former member, Mr. E. Ernest Green, presented his collection of British Tortricidae, to be embodied in our collections.

Following his death in 1950 very many specimens of lepidoptera, British and exotic, from the collections of our Hon. Life-President, Mr.

H. J. Turner, presented by his son, have been embodied in the collections.

In 1952 our member, the Rev. D. P. Murray, presented the whole of his Palaearctic, African, Indian and North American Lycaenidae, in 2 cabinets. This has been supplemented by many specimens from Mr. F. T. Vallins' own collection, and the whole systematically rearranged by him.

**TRUSTEES.** The first recorded Trustee of the Society was J. R. Wellman, who served in that capacity from a date unknown till 1888, when Edward Step and Robert Adkin were appointed. After Step's resignation, A. E. Tonge was appointed in 1920. On Robert Adkin's death in 1935, J. H. Adkin was appointed. Following the death of Tonge in 1939, W. Rait Smith was appointed in his stead, while when J. H. Adkin died in 1948 he was succeeded by Stanley N. A. Jacobs, he and Rait Smith being our Trustees at the present time.

**OFFICERS.** The list of all Presidents is printed each year in the "Proceedings"; so will not be repeated here, but mention must be made of sad circumstances in 1930 and 1931. For the former year Mr. F. B. Carr was the elected President, but he died on 10th March without being able to assume the office. In his stead the Council appointed Mr. C. N. Hawkins to serve for the year. For 1932 Mr. Edward Step was President-designate, but he died in November 1931 and Mr. (afterwards Dr.) K. G. Blair was elected in his stead. It was typical of the man that Mr. Step had written the paper for his Presidential Address more than a year in advance—the History of the Society already mentioned—and to prevent its being lost, Mr. Blair read it at the end of his year of office instead of the main part of his own address.

The Vice-Presidents, one a year up to 1888, and two annually thereafter, are not similarly recorded, but as they have nearly all held office as President before or after their terms in the vice-chair, mention will only be made of those who are not included in the list of Presidents. With their year or years of office they are as follows:—1893, C. Fenn; 1895, J. Henderson; 1899, Dr. T. A. Chapman; 1903, J. H. Carpenter; 1914 and 1915, A. E. Gibbs; 1917, F. W. Frohawk; 1931, Lt. Col. F. A. Labouchere; 1941, H. G. Denvil; 1947, Sir Leonard Wakely; and 1949, J. L. Henderson. The pattern generally followed since there have been 2 Vice-Presidents, with the President holding office for one year only, is to elect a member as Vice-President for one year, President for the next year, and Vice-President again the year after that.

As regards the executive officers, the Society has been very fortunate in enjoying the services of enthusiastic members who have zealously continued in office for a number of years, thus ensuring stability and continuity in the administration. The record in this respect is held by Mr. W. West of Greenwich, number 10 on the members' register, who was first Curator in 1872, and continued in that office till his death in 1920, a period of 48 years.

The Honorary Treasurers on record have been as follows:—1872, J. G. Marsh; 1881, T. R. Billups; 1881 to 1892, Edward Step; 1893 to



1896, Robert Adkin; 1897 to 1918, T. W. Hall; 1919 to 1935, A. E. Tonge; 1936 to 1944, T. R. Eagles; 1945 to date, J. L. Henderson. Available records are incomplete as regards the years 1873 to 1880.

As regards the Honorary Secretaries, the available information is difficult to follow prior to 1879. Two Secretaries were provided for by the rules from 1886 till 1946. The first one in 1872 was J. Platt Barrett; G. C. Champion held the office from some date up to 1879, and W. C. Chaney also for part of that time. Subsequent holders of the office have been as follows:—1879 to 1881, Arthur Bliss; 1882, H. Cubison; 1883 to 1884, W. H. Miles; 1884 to 1887, W. A. Pearce; 1888 to 1892, H. W. Barker, with D. J. Rice for 1890 to 1891 and A. Short for 1892; 1893, F. W. Hawes and H. Williams; 1894 to 1931, Stanley Edwards (General), and H. J. Turner (Report); 1932 to 1940, Stanley N. A. Jacobs, with H. J. Turner continuing as Report Secretary up to 1935, after which he was succeeded by H. G. Denvil; 1941 to 1951, F. Stanley-Smith (General) with H. G. Denvil as Minuting Secretary till he was called up in May 1941, when he was succeeded by C. N. Hawkins till 1945, after which, in conformity with the altered Bye-law, there was one Secretary only; 1952 to date, F. T. Vallins.

As regards Honorary Librarians, the first one shown by the records was T. H. Hoey; next comes Edward Step up till some time in 1879. The others have been as follows:—1879, F. Stewart; 1880, A. J. Rose; 1881, G. Gill; 1882, P. J. Lowry; 1883 to 1887, W. Chaney; 1888 to 1892, D. J. Rice; 1893 to 1896, H. J. Turner; 1897 to 1903, H. A. Sauzé; 1903 to 1925, A. W. Dods; 1926 to 1952, E. E. Syms; 1953 to date, D. Leston.

In addition to W. West already mentioned as holder of the record for length of office (1872 to 1920) the only Honorary Curators have been S. R. Ashby from 1921 to 1944, and F. J. Coulson from 1944 to date. This too is remarkable; only three men, one of them not out, have carried the responsibility of building up and looking after our extensive collections in 82 years. Various Assistants have been appointed by the Council to deal with particular sections from time to time.

The office of Honorary Editor of Proceedings, whose title was simplified in 1946 to Honorary Editor, was first created in 1913. Prior to that our Proceedings and Transactions had been edited by members appointed from time to time by the Council. Thus we read that Richard South, who obviously had done the work before, was unable to carry it out in 1907, and Edward Step was appointed in his stead. The official Editors have been:—1913 to 1915, Edward Step; 1916 to 1944, H. J. Turner; 1945 to date, T. R. Eagles. In the inter-regnum between Mr. Turner's resignation and the appointment of Mr. Eagles, the preparation of the 1944-45 Proceedings was carried out by the Honorary Secretary.

The office of Honorary Lanternist was created in the 1946 revision of the Bye-laws. Prior to that our own lantern had been looked after and operated for many years by Mr. J. H. Adkin. After we moved to Burlington House in 1945, the Royal Society's epidiascope was operated for us, when wanted, by that Society, but since we have had an official



lanternist he has been allowed to operate the instrument. The only holder of the office, from 1947 to date, has been F. D. Buck.

**HONORARY MEMBERS.** The 5 surviving Patrons became the first Honorary Members created under the 1891 Bye-laws. They were Lord Avebury, H. T. Stainton, F.R.S., R. McLachlan, F.R.S., Lord Walsingham, M.A., and J. W. Dunning, M.A. Subsequently, in the years stated, the following have been made Honorary Members in recognition of distinguished services to the Society or to Entomology:—1889, W. Chaney; 1892, J. R. Wellman; 1912, Dr. W. Bateson, F.R.S. and Prof. E. B. (afterwards Sir Edward) Poulton, D.Sc., M.A., F.R.S.; 1918, F. A. Dixey, M.A., M.D., F.R.S.; 1922, G. C. Champion, A.L.S.; 1932, Stanley Edwards and Robert Adkin; 1935, H. J. Turner; 1941, Major H. S. Fremlin, M.R.C.S.; 1942, Miss L. M. Chapman; 1943, F. W. Frohawk; 1950, K. G. Blair, D.Sc., and E. A. Cockayne, D.M., F.R.C.P.; 1951, His Excellency Walter S. Gifford, The American Ambassador to the Court of St. James.

Under the Bye-laws as revised in 1946 no fewer than 7 members who had by then belonged to the Society continuously for more than 50 years, were, from 1st January 1947, created Special Life Members, the year of joining being shown in brackets after their names:—B. W. Adkin (1886), H. Moore (1889), W. Mansbridge (1889), Colbran J. Wainwright (1889), A. H. Hamm, M.A. (1891), Hugh Main, B.Sc. (1892), and T. L. Barnett (1896). Since then the following have been added on 1st January of the years shown, following the fiftieth year in which they were elected:—1950, Rev. F. M. B. Carr, M.A.; 1951, F. H. Day; 1953, E. J. Hare, C.B.E.

## EXTERNAL AFFAIRS.

**THE FIRST GREAT NATIONAL ENTOMOLOGICAL EXHIBITION** was held at the Royal Aquarium, Westminster, from Saturday, 9th March, to Saturday, 23rd March 1878. It was organised by a committee nominated by the Royal Aquarium Society and managed by Mr. John T. Carrington, the Naturalist to the Royal Aquarium, with the assistance of Mr. A. B. Farn as Honorary Secretary. Mr. Farn was one of the earliest members of the "South London", and Mr. Carrington joined just as the Exhibition was starting. The whole of the insects shown were amateur collections. They included lepidopterous larvae preserved by our Patron Lord Walsingham, Perthshire insects shown by Sir Thomas Moncrieffe, Northern insects by Mr. Prest of York, Fenland ones by Mr. Farn, general British moths by Mr. Wellman, and micro-lepidoptera by Mr. W. Machin. While this exhibition was warmly supported by some of our members, others thought it was *infra dig.* for a scientific body to be mixed up with music-hall turns and side-shows. Some resignations followed, and when Mr. Carrington started holding weekly entomological meetings of his own this took away others and kept recruits away.

**RAILWAY EXTENSION TO HIGH BEECH.** In 1881 it was proposed to extend the Great Eastern Railway from Chingford to High Beech, in

Epping Forest. A deputation which included the President and Secretary of the Society attended before the Metropolitan Board of Works, which thereupon agreed to present a petition to the House of Commons against the extension. Letters were also sent to Members of Parliament for South London, and replies were received from Baron de Worms and others. The opposition proved successful on this, as on two other occasions, and the extension never took place.

**PROTECTION OF INSECTS COMMITTEE.** In 1897, the Committee asked for a member of the Society to sit with them. Mr. Robert Adkin was appointed, but unfortunately, this Committee seems to have faded out shortly after.

On 12th March 1947 the Society organised a meeting at Burlington House to discuss the protection of British insects. It was attended by leading representatives of the Royal Entomological Society of London and of its "Protection Committee", the London Natural History Society, and the London Nature Reserve Committee. A resolution was passed pledging the support of the "South London" to any measures taken by the Protection Committee to conserve indigenous British insects. At the same time it asked the Royal Entomological Society to broaden the basis of its Protection Committee. Soon afterwards the Society was invited to nominate a representative to that Committee. Its first nominee was Mr. E. W. Classey, F.R.E.S.

**AMALGAMATIONS.** Twice, first in 1907, and again in 1912, amalgamation with the City of London Entomological Society was considered without result. That Society subsequently expired.

In 1932 fusion with the London Natural History Society was considered in Council. The proposal from that Society was that the "South London" should merge with, or become, the entomological section of that Society. Nothing came of it.

**LEGISLATION.** In 1908 the Society supported the Commons and Footpaths Preservation Society in their efforts to get the Public Rights of way and Access to Mountains Bill passed by parliament.

In 1911 a resolution condemned the action of the Government in misappropriating a portion of the ground formerly allotted to the Natural History Museum as a spirit store.

In 1920 the Society passed a resolution for the preservation of Epping Forest, supporting action by the Essex Field Club, and sending copies to the Prime Minister, the Corporation of the City of London, and the local Member of Parliament.

In 1921 a resolution condemned the proposed alienation of a large area of Esher Common for golf. This was sent to the Commons and Footpaths Preservation Society.

In 1929 a resolution protested against the letting of shooting rights on the Ashridge Estate by the National Trust, so supporting the Hertfordshire Natural History Society.

Also in 1929, supporting action by the Entomological Society of Hampshire as it was then called, a resolution was sent to the Forestry

Commission at Lyndhurst advocating the management of the New Forest on natural, as opposed to commercial, lines, and deprecating the substitution of pines for broad-leaved trees.

In 1934 the Society supported an appeal to set up Hadleigh Woods near Southend-on-Sea as a nature reserve.

In 1946 a letter was sent to the Ministry of Town and Country Planning asking for the course of the proposed new main road serving the satellite town at Stevenage to be diverted 100 yards so as to avoid a historic collecting ground known as Watery Grove.

**AFFILIATIONS.** South Eastern Union of Scientific Societies, 1897. Corresponding Society of British Association for the Advancement of Science, 1906. Southern Federation of the Ramblers' Association, 1938.

**ENTOMOLOGICAL SOCIETY CENTENARY.** In May 1933 the President and Treasurer attended the centenary celebrations of the Entomological Society of London, presenting an illuminated address. This was the occasion on which the word "Royal" was added to the title of that Society.

**FESTIVAL OF BRITAIN.** In 1951, "Festival Year", the Society undertook the local arrangements for the seventh Annual Congress of British Entomology sponsored by the Society for British Entomology and held in London. Very little interest was taken by our members in the event. The opening meetings were held in the Natural History Museum at South Kensington, but the other meetings were held in "our", that is to say The Royal Society premises in Burlington House, provided by us for the occasion.

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That concludes my compilation of our history, but I must ask you to bear with me a little longer. I wish to thank you all for the loyal support you have given me during my second tenure of the chair. I must confess that before accepting the office, I was not a little worried by the talking that went on during the less interesting parts of our formal meetings, which sometimes made it impossible for members at the back of the room to hear what was being said. So far as I have been able to judge, that trouble diminished without my having to use the gavel too frequently. To the Council I tender my thanks for their help. If there was an occasion when we did not see eye to eye, I have no doubt they felt their view was correct. To the permanent officers, on whom the running of the Society devolves, I am grateful because they kept the work entirely away from me, so that my responsibility was merely nominal. As I said earlier, the new boy, Leston, has done very useful work in the Library. Coulson, as ever, plods steadily with the maintenance of the collections. Eagles in some ways has the most difficult job, as he is bound to depend so much on other people, who let him down; but the President can always feel sure that he is doing his utmost. Henderson so marshals his reports that there is nothing anyone can do but accept his advice. And Vallins—the king-pin—I

thought I knew what a secretary should do, but he has taught me a lot. I, as well as the whole Society, owe him a great deal for his devotion during the last twelve months. Thank you all.

It now only remains for me to vacate the chair, and instal therein your newly chosen President, Mr. Stanley Jacobs. This is of course the second time you have elected him, the previous time being for 1944. He has already served, and served us well, in various other capacities and in various ways. He was Secretary for nine years from 1932 to 1940, Vice-President in 1943 and 1945, and has been a Trustee since 1949. He painted most of the originals of the coloured plates in our Proceedings illustrating the micro-lepidoptera. He helps us too in other ways. He is well-known both in this Country and on the Continent of Europe as one of our leading micro-lepidopterists.

Mr. Jacobs, will you please come forward.

## FIELD MEETINGS, 1953.

BANSTEAD DOWNS—4th April 1953.

*Leader, Mr. F. RUMSEY.*

The first outdoor meeting of the year is always an attraction and thus despite poor weather prospects 13 members and friends attended. There were two showers of hail but these were soon over and did not spoil the day.

As usual here the borings of the larva of the clearwing moth *Aegeria andrenaeformis* Lasp. were noted in the stems of the bushes of *Viburnum lantana* L. Other Lepidopterous larvae noticed included *Pseudoterpna pruinata* Hufn. (Geometridae), *Lozopera dilucidana* Steph. (Phaloniidae) in stems of *Pastinaca sativa* L. (Umbelliferae), *Eucosma foenella* L. (Eucosmiidae) in rootstocks of *Artemisia vulgaris* L. (Compositae) and —on the beech trunks—cases of the larvae of the Tinaeidae *Narycia monilifera* Geoffr. (*melanella* Haw.) and *Luffia lapidella* Goeze.

The only Dipteron recorded was *Tephritis vespertina* Loew.

A nuthatch was seen carrying mud or clay to its nesting hole in a large beech tree. Several magpies were about.

The party were entertained to an excellent tea provided by Mrs. Rumsey and then spent an hour or so discussing entomology by the fireside.

EYNSFORD—19th April 1953.

*Leader, Mr. C. H. HARDS.*

Larvae of *Phthorimaea tricolorella* Haw. (Gelechiidae) were not uncommon on *Stellaria holostea* L. (Caryophyllaceae) and when searching for these a single case of *Coleophora olivacella* Staint. was found on the same plant. One larval case of *Luffia sepium* Spey. (Tinaeidae) was beaten from yew.

An example of the parasitic bee *Melecta punctata* F. Scop. was netted—a very striking species with tufts of white hairs forming spots along each side and contrasting with the black abdomen.

Half-a-dozen specimens of the bug *Sehirus bicolor* L. were found sunning themselves on nettles by the roadside on the way to the tea place.

A fine tree of the cut-leaved elder, *Sambucus nigra* L. var. *laciniata* L. was noted near the station.

At the foot of a poplar tree, less than 3 feet from the ground, a mistle-thrush's nest was found containing 4 eggs.

Several specimens of the butterflies *Gonepteryx rhamni* L. and *Nymphalis io* L. were met with in sheltered places.

The day was enjoyable as the cold wind was offset by brilliant sunshine.





Boxhill, Surrey (27th August 1950).

T. R. Eagles, N. A. Lockington, R. E. R. Parsons, ———? Mrs F. M. Struthers, F. M. Struthers, W. J. Finnigan, Miss G. J. Ashby, D. W. Thorpe-Young, F. D. Buck, A. W. Gould, Master M. Buck, R. Thornton, F. Rumsey, Mrs. F. D. Buck, F. T. Vallins, R. D. Weal, D. Leston, and Mrs. D. Leston.



Ranmore, Surrey (26th April 1953).

D. Ollevant, Stig Torstenius, M. Niblett, F. Rumsey, J. T. May, S. Wakely, F. Svms. T. R. Eagles, W. H. Spreadbury, H. G. Tunstall, and W. J. Finnigan.

*Photos. S. Wakely.*

## BOXHILL TO RANMORE COMMON—26th April 1953.

Leader, Mr W. H. Spreadbury.

Fourteen members and friends were present.

The weather was sunny but rather cold and a persistent East wind made butterflies scarcer than a previous visit had led one to hope.

Many migrant birds were heard or seen including Swallows, Cuckoo, Chiffchaff, Willow Warbler, Whitethroat and Blackcap. In the woodland Tree Creepers, Goldcrests and Cole Tits were noted singing. A blackbird's nest in the crotch of an ancient beech tree had the hen sitting and another nest had newly-hatched young.

The butterflies *Euchloë cardamines* L. and *Pararge aegeria* L. were common along the rides and on the downland slopes *Callophrys rubi* L. was plentiful together with a few *Erynnis tages* L. and *Pyrgus malvae* L. Other Lepidoptera were *Bapta bimaculata* F. and *Ectropis bistortata* Goeze. Among larvae beaten were those of *Deileptinia ribeata* Clerck and *Eilema deplana* Esp. on yew and of *Bacotia sepium* Spey. on blackthorn.

Beetles noted were *Pilemostoma fastuosa* Schall. on *Inula conyza* DC. (Compositae), *Cleopus pulchellus* Hb. on the leaves of *Verbascum thapsus* L. (Scrophulariaceae), *Epitrix atropae* Fd. common on a few plants of *Atropa belladonna* L. (Solanaceae) and *Caenorhinus aeneovirens* Marsh.

The following Hemiptera were seen:—*Gonocerus acuteangulatus* Goeze, *Elasmotethus interstinctus* L. and *Troilus luridus* L.

On the yews were midge galls of *Taxomyia taxi* Inchb. and mite galls of *Eriophyes psilaspis* Nal. and on the wayfaring trees the mite galls of *Eriophyes viburni* Nal.

A good show of Spring flowers was noted—Cuckoo Pint, Toothwort, Sweet Woodruff, Yellow Archangel, Greater Celandine, Goldilocks, Wood Spurge, Sun Spurge, Bluebells and the more local Lamb's Lettuce—*Valerianella locusta* (L.) Betsche (Valerianaceae).

The only fungus was a fine growth of *Polyporus squamosus* Fr. on a dead beech bole.

On the downland slope 3 slowworms were found under a piece of sheet iron and a fine adder was seen sunning itself on the footpath.

Tea was taken in the garden of the Ranmore Common Tea-house.

See Plate IV.

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EFFINGHAM—2nd May 1953.

Leader, S. WAKELY.

The weather was all that could be desired for this meeting, and those present enjoyed the bright sunshine which persisted all day. It was decided to try the common by the station for a start and several case-bearing larvae of the local moth *Proutia betulina* Zell. were beaten



from the blackthorns. Moving on to Barnsthorns Wood, which was entered near the railway line running towards Horsley, a search was made for the larvae of *Parascotia fuliginaria* L. One was soon found under a log, but we were unable to repeat last year's luck when several dozen were found under one large trunk. It was pleasing to find the species much more widespread than at first thought. Lunch was partaken of in beautiful sylvan surroundings, and the numbers of *Gonepteryx rhamni* L. flying around was commented on by the members. This was within sight of the main road near Horsley, and rather further afield than usual for this meeting. A few more larvae of *fuliginaria* were found just after lunch, this time under huge tree-trunks which required the efforts of several persons to roll over.

Beating the birches produced a number of beetles, including *Coeliodes rubicundus* Hb. and *Deporaus betulae* L., but a better find was a pair of *Orchesia undulata* Kraatz on fungus under a log. This is a very active species with a disconcerting habit of jumping in a manner similar to some of the "click" beetles.

Leaving the western end of the wood, the return route was by the old bridle road just south of Blackmore Heath Farm, which leads through the part of the wood near the Effingham-Ockham road. This end of the wood had been systematically burnt during the last few months, and had been spoilt from an entomological point of view.

On reaching the road, tree stumps were pointed out on which the first *fuliginaria* larvae were noticed in this district several years ago, and three more larvae were found on these—much to everyone's surprise.

Other insects noted were:—

Lepidoptera.—*Anticlea derivata* Schiff. and *Aethalura punctulata* Schiff.

Hemiptera.—*Aneurys laevis* F.

Birds noticed were: Nightingale and Turtle Dove (both heard); Tree Creeper and Chaffinch (nest of each found).

CHIDDINGFOLD—10th May 1953.

Leader, Mr. R. MERE.

The party met at Witley Station and proceeded by car to Hog Wood, some five miles out of Chiddingfold; where a considerable further number of members joined during the course of the day. In all 44 members and friends attended, but unfortunately neither the weather nor the catch were worthy of so large a gathering. The morning was cloudy. In the afternoon the sun shone much of the time. Insects were scarce.

Butterflies noted included *Leptidea sinapis* L., *Argynnis euphrosyne* L. and *Hamearis lucina* L. Larvae of *Ypsolophus nemorellus* L. (Plutellidae), *Alucita galactodactyla* Schiff. (Alucitidae), *Eriocrania*

*chrysolepidella* Zell. (*kaltenbachii* Wood in Staint.) (Micropterigidae) and *Eriogaster lanestris* L. (Lasiocampidae) were seen.

Of Coleoptera there were recorded *Calvia 14-guttata* L., *Deporaus betulae* L., *Polydrusus tereticollis* Deg., *Phyllobius argentatus* L., *P. maculicornis* Gmel., *Rhynchaenus rusci* Hbst., *Anthonomus rubi* Hbst., *Dorytomus dejeani* Faust, *Sitona striatellus* Gyll. (*tibialis* Hbst.), *Microlestes maurus* Sturm and *Bembidion biguttatum* F.

A nest of a Long-tailed Tit was found in a hawthorn bush and the Grasshopper Warbler heard.

Tea was provided by Mrs. Mere at Mr. and Mrs. Mere's house at Chiddingfold.

It was gratifying to see members from so far afield—one was from Derbyshire and two from East Kent.

Thanks are due to several members who assisted by providing transport in their cars to and from the station, and in particular to Mr. Castle Russell.

## SHEEPLEAS, EAST HORSLEY—16th May 1953.

Leader, Mr. T. R. EAGLES.

During the morning there was some rain so that the walk through the fields to St. Mary's Church was not so pleasant as usual. A vetch growing freely along the path beside the railway attracted attention but proved to be merely a pink flowered form of *Vicia sepium* L. Some time was spent at a small pond alongside the path to the Church. Dead stems of *Alisma plantago-aquatica* L. (Alismataceae) were collected and contained larvae and pupae of *Phalonia alismana* Rag. (Lep., Phaloniidae). A Water Crowfoot growing freely in the pond appeared to be *Ranunculus aquatilis* L. s.sp. *heterophyllus* (Weber) Syme.

After lunch the party proceeded to the ground where *Hamearis lucina* L. is often so plentiful but this year the meeting was too early. The following imagines of butterflies and moths were noted:—*Pararge aegeria* L., *Argynnis euphrosyne* L., *Erynnis tages* L., *Pyrgus malvae* L., *Euclidimera mi* Clerck, *Bapta bimaculata* F., *Aethalura punctulata* Schiff., *Asthena albulata* Hufn., *Acasis viretata* Hb. and *Cosymbia linearia* Hb.

Larvae of *Philereme transversata* Hufn. were found on the buckthorn bushes and those of *Eriocrania chrysolepidella* Zell. (*kaltenbachii* Wood in Staint.) (Micropterigidae) in leaves of hazel.

Ova of the butterflies *Euchloë cardamines* L. and *Gonepteryx rhamni* L. were noted.

Many Coleoptera were taken. In particular a careful search of an old spruce stump revealed *Cicones variegatus* Hellwig, *Mycetophagus atomarius* F. and *Ptilinus pectinicornis* L. Other species met with included:—*Curculio villosus* F., *Erirrhinus* (*Thryogenes*) *nereis* Payk., *Diplocoelus fagi* Guérin-Mén., *Olibrus corticalis* Panz., *Byturus aestivus*

L., *Anaspis humeralis* F., *Timarcha coriaria* Laich., *Attelabus nitens* Scop. and *Lasiorrhynchites cavifrons* Gyll.

Hemiptera noted were *Aelia acuminata* L., *Harpocera thoracica* Fall. and *Deraeocoris lutescens* Schill. and Diptera, *Otites guttata* Meig. (Otitidae).

Tea was taken at "The Green Lantern" near the Church.

#### CLAYGATE TO OXSHOTT—24th May 1953.

Leader, Mr. D. W. THORPE-YOUNG.

The butterflies *Nymphalis io* L. and *Euchloë cardamines* L. and the day-flying moth *Pseudopanthera macularia* L. were on the wing. Other moths seen were *Drepana falcataria* L., *Lobophora halterata* Hufn., *Eulype hastata* L., *Bapta bimaculata* F. and *Bena fagana* F. (*prasinana* auctt. nec L.). The larvae noted included *Biston strataria* Hufn., *Pseudoips prasinana* L. (*bicolorana* Fuess.), *Dryobotodes protea* Schiff., *Archiearis parthenias* L. and *A. notha* Hb.

A great many species of Coleoptera were seen. The more interesting were:—On Oxshott Heath, *Cicindela sylvatica* L., *Scymnus auritus* Thnbg., *Phytodecta decemnotata* Marsh., *Lasiorrhynchites cavifrons* Gyll., *Ceuthorhynchus quadridens* Panz.; on Arbrook Common, *Melasis buprestoides* L., *Byturus ochraceus* Scriba, *Mantura obtusata* Gyll. and:—

On mud at the Black Pond—*Acupalpus dorsalis* F., *Harpalus tardus* Panz., *Stenus rogeri* Kraatz and *Platystethus alutaceus* Thoms.

Beaten from pine:—*Corticarina gibbosa* Hbst., *Salpingus castaneus* Panz. and *Rhinomacer attelaboides* F.

Beaten from birch:—*Caenorhinus nanus* Payk., *C. longiceps* Thoms., *Deporaus betulae* L., *Rhynchaenus rusci* Hbst. and *Anoplus plantaris* Naezen.

Beaten from willow near the Black Pond:—*Donacia clavipes* F.

Hemiptera noted from Arbrook Common were:—*Drymus sylvaticus* F., *Stygnocoris fuliginosus* Geoff., *Mocytia crocea* H.-S. and *Stenocranus minutus* F.

#### PRINCES RISBOROUGH—30th May 1953.

Leader, Mr. H. E. WEBB.

The weather was dull, showery and windy but brightened up towards tea time.

Coleoptera taken or noted included:—*Cantharis figurata* Mann., *C. rustica* Fall., *C. nigricans* Muell., *C. livida* L., *Anaglyptus mysticus* L., *Gramoptera ruficornis* F., *Cryptocephalus aureolus* Suff., *C. bipunctatus* L. ab. *sanguinolentus* Scop., *Timarcha tenebricosa* F., *T. coriaria* Laich., *Lochmaea crataegi* Forst., *Oedemera lurida* Marsh., *Mordellistena abdominalis* F.

In addition to the commoner butterflies the following were seen:—*Hamearis lucina* L., *Cupido minimus* Fuessl., *Aricia agestis* Schiff., *Callophrys rubi* L., *Erynnis tages* L. and *Pyrgus malvae* L. Moths were *Parasemia plantaginis* L., *Callimorpha jacobaeae* L., *Eilema sororcula* Hufn., *Phytometra viridaria* Clerck, *Cosymbia linearia* Hb., *Anaitis plagiata* L., *Epirrhoë alternata* Muell., *Eupithecia satyrata* Hb. and *Procris geryon* Hb. The last named began to appear in numbers when the sun came out in the afternoon. Beating produced several common species of Geometrid larvae; those of *Eupithecia sobrinata* Hb. were abundant on the Junipers.

The vegetation was very lush, the slopes being covered with a thick carpet of *Helianthemum chamaecistus* Mill. and *Hippocrepis comosa* L.

*Atropa belladonna* L., *Hesperis matronalis* L. and *Pentaglottis sempervirens* (L.) Tausch. (Alkanet) were in full bloom and very striking. The interesting saprophytic plant *Monotropa hypopithys* agg. (Yellow Bird's Nest) was growing from the dead leaves under beeches.

A very generous tea was provided at the "Plough Inn".

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## BRADING, ISLE OF WIGHT—6th June 1953.

Leader, Mr. S. WAKELY.

After a week of cold and rainy weather, the members attending this meeting were rewarded with one of those meteorological changes for which our country is famous and enjoyed this outing in perfect weather. Several of the party had not been to the Island before and we were all interested in the crossing by boat from Portsmouth to Ryde, with views of many of the warships getting ready for the forthcoming Naval Review.

We were met at Brading by Mr. J. Lobb, who lives on the Island, and who conducted us to Brading Down. It was hoped to see *Melitaea cinxia* L. here, and we were not disappointed. Those wanting specimens were able to satisfy their requirements without appearing to diminish the numbers of this local species. Both sexes were out and in very fresh condition.

The Small Blue (*Cupido minimus* Fuessl.) was particularly common, and few of those present had ever seen it previously in such abundance.

A small shrub with whitish flowers was noticed growing on the southern slopes of the down. This was recognised as *Cotoneaster microphylla*, a plant also recorded from St. Boniface Down, Ventnor, and Freshwater. Mr. Syms found a strange-looking fasciated growth on one of these bushes.

Other butterflies noted were *Vanessa cardui* L. and *V. atalanta* L., *Pararge aegeria* L., *Callophrys rubi* L., and *Aricia agestis* Schiff. One *Arctia villica* L. was reported as seen. A larva of the Plume *Alucita baliodactylus* Zell. was taken on marjoram. The only dipteran of interest seen was *Helophilus pendulus* L.

The most noteworthy beetle taken was a single male *Drilus flavescens* Geoff.

Our thanks are due to Mr. Lobb not only for suggesting the route to take, but also for the excellent place for tea to which we made our way about 5 o'clock. Here fifteen of us assembled and enjoyed a first-class tea, after which we caught the train at Brading just after 6 p.m., arriving back at Waterloo on the stroke of 9 o'clock.

See Plate V.

#### CHAILEY, SUSSEX—14th June 1953.

Leader, Mr. D. A. ODD.

The most interesting species of Lepidoptera noted were *Cucullia chamomillae* Schiff., *Polyploca ridens* F. and *Callophrys rubi* L. (all as larvae) and *Thecla quercus* L. (pupae). The following Syrphidae were taken:—*Ferdinandea cuprea* Scop., *Chrysogaster nobilis* Fall., *Eristalis sepulchralis* L., *Merodon equestris* F., *Helophilus transfugus* L. and *Criorhina berberina* F. var. *oxyacanthae* Meig. A pair of *Baccha obscuripennis* Meig. were bred from larvae found feeding on an aphid on *Hieracium*.

Mrs. Odd very kindly entertained the party to tea.

#### COLLEY HILL—22nd June 1953.

Leader, Mr. F. M. STRUTHERS.

Nine members and friends attended. The day was sunny but there was a strong wind.

The party proceeded from the bus terminus to the brow of the hill. Collecting was not possible here so it was found necessary to work the lower more sheltered slopes. Here numerous Lepidoptera were seen including *Callimorpha jacobaeae* L., *Scopula immutata* L., *S. ornata* Scop., *Anaitis plagiata* L., *A. efformata* Guen., *Bapta termerata* Schiff., *Pseudopanthera macularia* L., *Lophopteryx capucina* L., *Pararge aegeria* L., *Cupido minimus* Fuess., *Macrothylacia rubi* L., *Zygaena filipendulae* L. and *Z. trifolii* Esp. The larvae of *Cucullia verbasci* L. were abundant on the mulleins.

Syrphidae of interest noted were *Sericomyia silentis* Harris and *Xylota xanthocnema* Collin.

About 30 species of Coleoptera were noted, but they were all exceedingly common except (1) a large colony of *Bradycellus sharpi* Joy which were found in a heap of decayed faggots at the top of the hill and (2) occasional examples of *Lagria hirta* L. and *Cryptocephalus aureolus* Suffr. which were swept off low growing plants under isolated trees on the slopes.

Four species of orchid were noted:—*Cephalanthera damasonium* (Mill.) Druce, *Ophrys apifera* Huds., *Aceras anthropophorum* (L.) S. F. Gray and *Anacamptis pyramidalis* (L.) L. C. Rich.

A large number of martins were seen, also magpies and the green woodpecker.

### FOLKESTONE WARREN—27th June 1953.

Leader, Mr. H. E. WEBB.

The party of 23 went by special coach from Hyde Park Corner to the Warren where they spent nearly 5 hours. The weather was fine but rather windy with little sunshine. Before returning to London the party enjoyed a good tea at the Highcliffe Tea Gardens (The Valiant Sailor) at the top of Dover Hill, Folkestone.

On the slopes were beautiful masses of *Ononis spinosa* L. in full bloom. This locality is one of the very few places where the moth *Aplasta ononaria* Fuessl. is to be found. On this occasion it was plentiful. May it long remain so. Another local moth noted was the clearwing *Aegeria chrysidiformis* Esp. Other interesting species observed were *Setina irrorella* L., *Cidaria fulvata* Forst., a fine aberration of *Pseudopanthera macularia* L., *Dipsosphesia scopigera* Scop., *Nomophila verbascalis* Schiff., *Laspeyresia microgrammana* Guen. and *L. leplastriana* Curt.

The Coleopterists found the slopes very interesting and took or observed the following:—*Quedius picipes* Man. and *Athous bicolor* Goeze under stones; *Bruchus loti* Payk. swept from *Lotus corniculatus* L.; *Cryptocephalus labiatus* L. swept from *Hypericum* sp. (normally taken from birch); *Ceuthorrhynchidius troglodytes* F. on *Echium vulgare* L.; *Baris laticollis* Marsh. in cracks in stems of *Brassica oleracea* L.; by general sweeping—*Cryptocephalus fulvus* Goeze, *Longitarsus pellucidus* Foud., *Batophila rubi* Payk. and *Ceuthorrhynchidius rufulus* Dufour.

Large plants of *Brassica nigra* (L.) Koch were a mass of yellow flowers in many places, and in one spot at the top of the cliffs there was an extensive patch of *Bunias orientalis* L., an uncommon crucifer with very interesting seed pods.

Towards the end rain threatened but it held off until the party were safely in the tea rooms.

### NORBURY PARK AND DRUID'S GROVE—5th July 1953.

Leader, Mr. W. H. SPREADBURY.

Eleven members enjoyed a day of uninterrupted sunshine.

Birds were rather quiet but Blackcap, Whitethroat and Chiffchaff sang occasionally. A Stock-Dove was heard "grunting" and several good views of Spotted Flycatchers were obtained.

The most noteworthy Lepidoptera seen were *Strymonidia w-album* Knoch, *Polygonia c-album* L. and *Abraxas sylvata* Scop. Others seen included *Pieris napi* L., *Vanessa atalanta* L., *Aglaia urticae* L., *Aphantopus hyperantus* L., *Thymelicus sylvestris* Poda, *Cosymbia punctaria* L., *Lygris pyraliata* Schiff., *Nymphula stagnata* Don., *Pyrausta purpuralis* L. and *Stenoptilia pterodactyla* L.

The dragonfly *Agrion splendens* Harris was numerous by the river-side. Syrphidae of interest were *Paragus tibialis* Fall. and *Syrphus grossulariae* Meig. *Trypeta tussilaginis* F. was abundant on *Arctium minus* Hill (Bernh.).

Plant galls noted were as follows:—CECIDOMYIIDAE (DIPTERA): *Contarinia scrophulariae* Kieff., *C. solani* Rubs., *Dasyneura epilobii* Loew, F., *D. fraxini* Kieff., *D. fraxinea* Kieff. ERIOPHYIDAE (ARACHNIDA): *Eriophyes convolvens* Nal., *E. macrorrhynchus* Nal., *E. tristriatus erinus* Nal. and *Phyllocoptes fraxini* Nal. PSYLLIDAE (HEMIPTERA): *Aphalara nebulosa* Zett. and *Psyllopsis fraxini* L.

Leaves of the following plants were mined by Dipterous larvae:—*Rumex* spp. by *Pegomyia nigritarsis* Zett., *Arctium minus* Hill (Bernh.) by *P. genupuncta* Stein., *Lithospermum officinale* L. by *Agromyza rufipes* Meig., *Centaurea nigra* L. by *Phytomyza atricornis* Meig. and *Tanacetum vulgare* L. by *P. tanacetii* Hendel.

Interesting plants noted were:—Bee, Pyramidal and Spotted Orchids, Foetid Iris, Deadly Nightshade, Common Hounds-tongue, Common Gromwell, Meadow Cranesbill, Small-flowered and Indian Balsam, Yellow Water-lily, Great Yellow Watercress and Meadow Sweet. A fine plant of Japanese Wineberry (*Rubus phoenicolasius* Maxim) was found in a thicket by the River Mole—doubtless bird-sown. This beautiful bramble is a native of Japan, Korea and N. China and occasionally is found as a garden escape.

It was noted that all the Walnut trees had the end shoots badly damaged and in places the ground was strewn with damaged shoots and leaves. Probably this was the work of squirrels trying to get at the young nuts.

Several fine groups of the fungus *Pleurotus ostreatus* (Jacq.) Fr. were seen.

A very welcome tea was enjoyed at the Railway Arms, Westhumble Street. (The Railway Arms has been renamed The Stepping Stones.)

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#### ALICE HOLT FOREST—12th July 1953.

Leader, BARON DE WORMS.

The weather could scarcely have been worse. The day dawned with low clouds and heavy rain which continued until lunch time. During a brief sunny interval a number of *Limenitis camilla* L. in fresh condition were seen and a single *Apatura iris* L. sailed for a few moments around an oak tree near the railway. Beating in the spruce plantation produced a number of *Alcis repandata* L. and *Semiothisa liturata* Clerck



while *Hydriomena furcata* Thunbg. was to be flushed from bushes everywhere.

In the afternoon the party was joined by students from the Lord Wandsworth College led by Mr. F. Goodliffe. A few *Argynnis paphia* L. were seen. Tea was taken at the Buckshorn Oak Inn.

## OXSHOTT HEATH AND ESHER COMMON—18th July 1953.

Leader, Mr. F. J. COULSON.

Except for one slight shower the weather was fine throughout the day although thunder rumbled most of the afternoon towards Surbiton. A dozen members and friends spent an enjoyable and profitable time.

In spite of the trampling of the many visitors to the locality it was observed that a number of interesting plants still survive on the flat area by the station. During the day the following plants were noted:—*Lotus uliginosus* Schk., *Filago minima* (Sm.) Pers., *Spergularia rubra* (L.) J. & C. Presl., *Eleogiton fluitans* (L.) Link., *Trifolium arvense* L. and *Tanacetum vulgare* L.

The butterflies on the wing were *Plebejus argus* L. and *Eumenis semele* L. In the firwoods *Bupalus piniaria* L. and *Semiothisa liturata* Clerck were flying and a specimen of *Hyloicus pinastri* L. was found settled about 7 ft. up on a fir bole. *Lycophotia varia* Vill., *Cybosia mesomella* L., *Eilema lurideola* Zinck., *Dioryctria palumbella* Fab. and *Endotricha flammealis* Schiff. were disturbed from the ling and *Loma-spilis marginata* L. occurred rather frequently in the woods. Other species taken were *Eucosma brunnichana* L. and *E. corticana* Hb., *Crambus pinellus* L. and *Parastichtis suspecta* Hb.

Almost full-fed larvae of *Panolis flammea* Schiff. were beaten from the firs and the larvae and ova of *Cerura vinula* L. and a larva of *Pterostoma palpina* Clerck were also taken.

As regards Coleoptera and Hemiptera, *Cicindela sylvatica* L. as usual was frequent on the ling slope by the Station and occurred also on the sandy patches of Esher Common together with *C. campestris* L. A black specimen of *Hoplia philanthus* Fuess. was found on a bush near the station and the hemipteron *Megalocoleus pilosus* Sch. occurred commonly on the tansy near by. In refuse *Monotoma longicollis* Gyll. and *Scydmaenus tarsatus* Müll. were fairly common. *Amara praetermissa* Sahlb. was frequent at the roots of ling. In the fungus *Daldinia cenicentrica* Ces. & de Nat., the usual occupants *Cryptophagus ruficornis* Steph. and *Litargus connexus* Geoff. were found and in puffballs *Pocadius ferrugineus* F. was noted. General beating produced *Cryptocephalus parvulus* Müll. and *C. labiatus* L., *Rhynchaenus rusci* Hbst. and *Caenorhinus nanus* Payk., *Euchlora dubia* Scop. var. *aenea* Deg., *Onthophagus fracticornis* Preys. and *Endomychus coccineus* L. were also taken.



A pond on Esher Common yielded well and *Dytiscus marginalis* L., *Acilius canaliculatus* Nic., *Colymbetes fuscus* L. and many other Hydradephaga, with the hemipteron *Notonecta maculata* F. were secured.

Sweeping the ling produced *Micrelus ericae* Gyll. and *Coccinella hieroglyphica* L. The hemipteron *Camptozygum pinastri* Fallén was beaten commonly and *Gastrodes grossipes* Deg. occasionally from the firs. The homopteron *Allygus modestus* Scott occurred on Esher Common.

The larva of the pine sawfly *Lophyrus pini* L. was present on the firs. The sandwasps *Ammophila campestris* Latr. occurred on sandy patches near ling on Esher Common and *A. sabulosa* L. on Oxshott Heath. Sand holes of *Cerceris arenaria* L. were numerous in similar situations.

Dragon-flies observed on the wing were *Anax imperator* Leach and *Aeshna cyanea* Müll.

The fungi noted were *Amanita rubescens* (Pers.) Fr. and *Amanitopsis fulva* (Schaeff.) W. G. Smith, commonly, and less frequently *Amanita pantherina* (DC.) Fr., *Lactarius turpis* (Weinm.) Fr., *L. quietus* Fr., *Russula emetica* (Schaeff.) Fr., *R. ochroleuca* (Pers.) Fr., *R. vesca* Fr., *Nolanea stauropora* Bres., *Flammula sapinea* Fr., *Paxillus involutus* (Batsch.) Fr., *Psalliota arvensis* (Schaeff.) Fr., *Boletus badius* Fr., *B. scaber* (Bull.) Fr., *B. versipellis* Fr., *Polyporus perennis* Fr., *Thelephora terrestris* Fr., *Calocera viscosa* (Pers.) Fr., *Lycoperdon perlatum* Pers., *Scleroderma aurantium* Pers. and the Mycetozoon *Lycogala epidendrum* Fr.

Interesting galls on heather, aspen, tansy and oak were collected.

The songs of the Tree-Pipit and the Common Whitethroat were heard.

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#### BOXHILL—26th July 1953.

Leader, Mr. F. RUMSEY.

The party assembled at Boxhill Station and after walking a short distance on the main road towards Dorking took the lane on the left to the Stepping Stones, crossed the River Mole and worked eastwards. Butterflies on the wing included *Pararge aegeria* L., *P. megera* L., *Eumenis semele* L., *Argynnis aglaia* L., *Polygonia c-album* L., *Polyommatus icarus* Rott., *Lysandra coridon* Poda, *Lycaena phlaeas* L. and *Hesperia comma* L. Downland moths noted were *Zygaena filipendulae* L., *Aspitates gilvaria* Schiff., *Ortholita bipunctaria* Schiff., *Anaitis efformata* Guen. and *Salebria semirubella* Scop. The clustered bell-flower, *Campanula glomerata* L. was in full bloom and abundant.

Special attention was given to leaf-miners of the dipterous family Agromyzidae and the following were found:—*Agromyza alnibetulae* Hend., *A. spiraeae* Kalt., *Melanagromyza pulicaria* Meig., *Phytobia*





Brading, Isle of Wight (6th June 1953).

S. Wakely, Dr. S. Asahina, L. H. S. Chevallier, D. W. Thorpe-Young, F. Rumsey,  
V. E. August, M. G. Morris, and R. Thornton.



Chipstead, Surrey (8th August 1953).

M. Niblett, G. C. D. Griffiths, S. Wakely, J. P. T. Boorman, C. N. Hawkins,  
R. M. Struthers, Mrs. F. M. Struthers, and F. Rumsey.

*Photos. S. Wakely.*

*pygmaea* Meig., *P. flavifrons* Meig., *P. verbasci* Bouché, *Phytagromyza hendeliana* Hering, *Liriomyza artemisicola* Hend., *L. trifolii* Burgess (= *congesta* Becker), *L. strigata* Meig., *L. taraxaci* Hering, *Phytomyza atricornis* Meig., *P. affinis* Fall., *P. chaerophylli* Kalt., *P. cirsii* Hend., *P. conyzae* Hend., *P. lappina* Gour., *P. pastinacae* Hend., *P. sonchi* R.-D., *P. sphondylii* R.-D., *P. vitalbae* Kalt. Also *Phytomyza tussilaginus* Hend., *Phytagromyza similis* Brischke and *Liriomyza sonchi* Hend.

Tea was taken at the Water Mill on the Reigate road.

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#### CHIPSTEAD—8th August 1953.

Leader, Mr. F. RUMSEY.

The route was via Park Downs through Banstead Woods to the field where the local plant *Teucrium botrys* L. grows.

Despite much of the Park Downs slopes having been burnt there were plenty of *Lysandra coridon* Poda. Other butterflies seen included: *Pararge aegeria* L., *P. megera* L., *Aphantopus hyperantus* L., *Argynnis aglaia* L., *Vanessa atalanta* L., *Polygonia c-album* L., *Aricia agestis* Schiff., *Polyommatus icarus* Rott., *Celastrina argiolus* L., *Thecla quercus* L., *Thymelicus sylvestris* Poda and *Ochlodes venata* Brem. & Grey. The moth *Anaitis efformata* Guen. was in great abundance, *Phytometra viridaria* Clerck was freshly out and *Calothysanis amata* L. was often put up. The following Coleoptera were noted:—*Icinius depressus* Payk., *Harpalus (Ophonus) azureus* F., *H. aeneus* F. (common), *Lebia chlorocephala* Hoff., *Brachinus crepitans* L. (very common), *Ocypus olens* Müll., *Cryptocephalus moraei* L., *Chrysolina hyperici* Forster.

A complete list of the leaf-mining Agromyzidae (Diptera) is:—*Agromyza nana* Meig. (on *Trifolium* sp.), *Liriomyza sonchi* Hend. and *L. strigata* Meig. (on *Sonchus arvensis* L.), *L. taraxaci* Hering (on *Taraxacum* sp.), *Phytobia labiatarum* Hend. (on *Stachys* sp.), *Phytomyza affinis* Fall. (on *Cirsium arvense* L.), *P. atricornis* Meig. (on *Senecio jacobaea* L., *Arctium* sp., *Linaria purpurea* (L.) Mill. and *Linum usitatissimum* L.), *P. lappina* Gour. (on *Arctium* sp.), *P. pastinacae* Hend. (on *Pastinaca sativa* L.), *P. scabiosae* Hend. (on *Scabiosa columbaria* L.), *P. sphondylii* R.-D. (on *Heracleum sphondylium* L.), *P. melana* Hend. (on *Pimpinella saxifraga* L.). Syrphidae of interest were *Cheilosia barbata* Loew, *Helophilus trivittatus* F. and *H. hybridus* Loew. The Conopid fly *Physocephala rufipes* F. was seen.

Tea was taken at the Bakery near Chipstead Station.

See Plate V.

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#### BOOKHAM COMMON—15th August 1953.

Leader, Mr. T. R. EAGLES.

The day was almost sunless but no rain fell: 21 members and their friends attended.

The Common and the woods were much drier than might have been expected in view of the wet Summer. The ponds were nearly empty and much overgrown. Two of the party worked the small patch of water remaining in the first pond for Coleoptera and Corixidae. Others swept the vegetation round about for Coleoptera and Hemiptera. Near the edge of the water there was a beautiful clump of *Veronica scutellata* L., the Marsh Speedwell, growing in soft mud. The Bulrush bed (*Typha latifolia* L.) could be examined in comfort owing to the recession of the water and pupae of *Nonagria typhae* Thnbg. were found in many of the stems. Near here an imago of *Mompha schrankella* Hb. (Lep., Cosmopterigidae) was found on a plant of one of the small flowered species of *Epilobium*, probably *E. adenocaulon* Hausskn.

One member had come for the sole purpose of searching umbelliferous plants for the mines of Diptera (Agromyzidae). These plants were in profusion and being in flower were easy to locate. Wild parsnip, Angelica, Hemlock, Rough Chervil and Burnet Saxifrage were plentiful as usual and in addition there were some striking patches of Pepper Saxifrage. On this last were found the mines of a species of Agromyzid little known in this country.

A visit was paid to an oak attacked by goat moth larvae—a “Cossus” tree. The exudation was abundant and had a strong smell of fermentation. A white fungus was growing where the liquid had flowed over the bark. A Red Admiral butterfly, some wasps, four or five honey bees, some green-bottle flies and a host of small flies were in attendance. It was noticed that the bees were clustered at one spot with their heads thrust down one particular boring—perhaps a new one.

Lepidopterous larvae obtained by beating included *Electrophaës corylata* Thnbg. and *Selenia bilunaria* Esp. White poplar suckers near the Bookham Grange Hotel were carefully searched and yielded small larvae. Some were either *Clostera pigra* Hufn. or *C. curtula* L.; others either *Tethea* or Schiff. or *T. ocularis* L. (*octogesima* Hb.). They were too small to be identified more precisely. In folded over leaves there were larvae of *Gracillaria stigmatella* F., a local species.

There were great masses of extra tall plants of fleabane in full bloom and on these were imagines of the Pyraustid moth, *Phlyctaenia lutealis* Hb.

Several species of fungus were noted, the most interesting being *Russula virescens* (Schaeff.) Fr. and *Lactarius flexuosus* Fr.

The following lists were sent in by members:—

#### PLANT GALLS.

Coleoptera:—*Saperda populnea* L.

Trypetidae:—*Urophora cardui* L., *U. jaceana* Her.

Cecidomyiidae:—*Contarinia jacobaeae* Lw., *Dasyneura crataegi* Winn., *D. populeti* Ruebs., *D. pustulans* Ruebs., *D. spadicea* Ruebs., *D. ulmariae* Br.-W., *Cystiphora sonchi* Lw., *Harmandia globuli* Ruebs., *Iteomyia capreae* Winn., *I. major* Kieff., *Kiefferiana pimpinellae* Lw., *Jaapiella veronicae* Val., *Lasioptera populnea* Wachtl., *Rhabdophaga rosarum* Lw., *R. salicis* Schrnk., *Wachtliella rosarum* Hardy.

Cynipidae:—*Andricus fecundator* Htg., *A. kollari* L., *A. ostreus* Gir., *Cynips folii* L., *C. longiventris* Htg., *Neuroterus albipes* Schrnk. f. *laeviusculus* Schrnk., *N. baccarum* L. f. *lenticularis* Oliv., *N. numismalis* Oliv., *Rhodites rosae* L., *Xestophanes potentillae* Vill.

One plant of *Cirsium vulgare* (Savi) Ten. with all white flowers was noted.

#### COLEOPTERA.

*Agabus bipustulatus* L., *Hydaticus seminiger* Deg., *Ilybius ater* Deg., *Scarodytes lineatus* F., *Hydroporus palustris* L., *H. angustatus* Sturm, *Laccophilus minutus* L., *Ochthebius minimus* F. (*impressus* Mm.), *Amara aulica* Panz., *Agonum piceum* L., *Telmatophilus caricis* Ol., *Phyllotreta vittula* Redt., *Apion virens* Hbst., *Orchestes stigma* Germar.

#### HEMIPTERA.

*Palomena prasina* (L.), 5th instar nymphs swept from thistles. *Empicoris vagabundus* (L.), common on lichen-covered hawthorns and blackthorns. *Polymerus unifasciatus* (F.) and *Charagochilus gyllenhali* (Fall.); both present on *Galium* spp. *Cyrtorhinus caricis* (Fall.), common at bases of clumps of *Juncus*.

#### DIPTERA.

Syrphidae of interest—*Pyrophaena granditarsa* Forst., *Chrysogaster* (sensu stricto) *solstitialis* Fall., *Volucella inanis* L., *Eristalis sepulchralis* L., *E. intricarius* L., *Helophilus lineatus* F., *H. transfugus* L. Conopidae—*Physocephala rufipes* F. Agromyzidae—(complete list of mines)—*Agromyza nana* Meig. (*Trifolium pratense* L.), *Phytobia labiatarum*\* Hend. (*Stachys* sp.), *Liriomyza amoena*\* Meig. (*Sambucus nigra* L.), *L. trifolii*\* Burgess (= *congesta* Beck.) (*Trifolium* sp. and *Vicia cracca* L.), *L. flaveola* Fall. (*Holcus lanatus* L.), *L. sonchi* Hend. and *L. strigata*\* Meig. (both on *Sonchus arvensis* L.), *L. taraxaci*\* Hering (*Taraxacum* sp.), *Phytagromyza tremulae*\* Hering (*Populus tremula* L.), *Phytomyza melana* Hend. (*Pimpinella saxifraga* L.), *P. affinis* Fall. (*Cirsium arvense* (L.) Scop.), *P. angelicae* Fall. and *P. angelicastris* Hering (both on *Angelica sylvestris* L.), *P. atricornis* Meig. (*Bidens tripartita* L. and *Pulicaria dysenterica* (L.) Bernh.), *P. pastinacae* Hend. (*Pastinaca sativa* L.), *P. silai* Hering (*Silaum silaus* (L.) Schinz. & Thell.), *P. sphondylii* R.-D. (*Heracleum sphondylium* L.) and *Napomyza xylostei* Kalt. (*Lonicera periclymenum* L.).

Other species of *Eristalis* noted were *E. arbustorum* L. and *E. horticola* Deg. The Orthopteron *Ectobius lapponicus* L. was reported.

Tea was taken at the Bookham Grange Hotel referred to above.

\*=Empty mines.

BAGSHOT (SURREY)—23rd August 1953.

Leader, Mr. R. F. HAYNES.

In spite of early morning sunshine, the weather turned very wet around 11 a.m. and although the rain ceased after a while, a cool,

drizzly atmosphere persisted all day, making collecting conditions most unpleasant.

After a late start, the small party, consisting only of 2 members and an overseas visitor from Hong Kong, set out from the station past Bagshot Church to the extensive heath and pine country lying between here and Bracknell in Berkshire. The recent rain had so saturated the undergrowth of bracken and heather that everyone soon became wet through underfoot. There seemed to be a deplorable absence of larvae—the following species were noted (in most cases single caterpillars only):—

*Notodonta ziczac* L., *N. dromedarius* L., *Lycophotia varia* Vill., *Scoliopteryx libatrix* L., *Anarta myrtilli* L., *Biston betularia* L.

In addition, a few very common geometrid loopers were beaten from birch and oak.

A solitary *Eumenis semele* L. was seen and a freshly emerged *Deuteronomos alniaria* L. was dislodged into the beating tray from an oak tree.

The following dipterous species were taken by Mr. Griffiths:—  
Syrphidae—*Sericomyia silentis* Harris.

Agromyzidae (complete list of mines)—*Agromyza alnibetulae* Hendel (*Betula verrucosa* Ehrh.), *Phytomyza tremulae* Hering (*Populus tremula* L.), *Phytomyza anthrisci* Hendel (*Daucus carota* L.), *P. atricornis* Meigen (*Sonchus oleraceus* L.), *P. ilicis* Curtis\* (*Ilex aquifolium* L.), *P. obscurella* Fallen (*Aegopodium podagraria* L.).

\* = Empty mines only.

ASH VALE—5th September 1953.

Leader, Mr. E. W. CLASSEY.

The party walked along the banks of the Basingstoke Canal as far as Mytchett and after working there among the birches and pines returned by the same route. In the canal were many interesting water plants and flying over it were several species of dragonfly. The following Trichoptera were taken:—*Glyptotaelius pellucidus* Retz., *Mystacides azurea* L., *M. longicornis* L. and *Limnephilus flavicornis* F.

About 30 species of Lepidopterous larvae were beaten or swept, including *Apatele leporina* L., *Amathes agathina* Dup. and *Pachynemina hippocastanaria* Hb. A number of the commoner butterflies were on the wing, including *Polygonia c-album* L.

The following is a list of the leaf-miners noted:—*Agromyza albipennis* Meig. (*Phragmites communis* Trin.), *A. alnibetulae*\* Hend. (*Alnus glutinosa* (L.) Gaertn.), *A. nana*\* Meig. (*Trifolium* sp.), *A. nigripes* Meig. and *A. distorta* Griffiths (*Glyceria maxima* (Hartm.) Holmb.), *Liriomyza flaveola* Fall. (*Phragmites communis* Trin.), *L. sonchi*\* Hend. (*Sonchus oleraceus* L.), *L. taraxaci*\* Hering (*Taraxacum* sp.),



*Phytomyza atricornis* Meig. (*Sonchus oleraceus* L.), *P. ilicis*\* Curtis (*Ilex aquifolium* L.).

Amongst plants, *Hieracium bladonii* Pugsl. of the Sabauda section was noted.

A fine clump of the fungus *Flammula carbonaria* Fr. was found on a burnt stump. *Boletus versipellis* Fr. was in some numbers.

Tea was taken at the Prior's Kitchen, Frimley.

\* = Empty mines.

## BOXHILL, SURREY—12th September 1953.

Leader, Mr. D. LESTON.

Attendance was 23 members and guests. The meadow at Burford Bridge was first worked then the party proceeded via Headley Lane to Juniper Valley, where the remainder of the day was spent. Notable captures were:—

Hemiptera.—*Thyreocoris scarabaeoides* (L.) and *Sciocoris cursitans* (F.) on the slopes of Juniper Valley. *Acanthosoma haemorrhoidale* (L.), approximately an equal number of 5th instar nymphs and imagines were beaten from hawthorn at Burford Bridge, some of the former were found to be parasitized by Phasiinae (Tachinidae). *Gonocerus acuteangulatus* (Goeze), a singleton beaten from ivy in Headley Lane. *Tropistethus holosericeus* (Scholtz), two were found beneath moss in Juniper Valley (det. D.L.).

Coleoptera.—*Panagaeus bipustulatus* (F.) beneath grass cuttings, Headley Lane. *Platambus maculatus* (L.) in R. Mole. *Aphidecta oblitterata* (L.) on larch, Juniper Valley. *Chrysolina violacea* (Mueller) under stones, Juniper Valley. *C. staphylea* (L.) on tansy, Burford Bridge. Other beetles taken included *Timarcha goettingensis* (L.) (*coriaria* Laich.) and *Onthophagus ovatus* (L.).

Diptera.—A large swarm of *Chlorops* sp. was found on ivy in Headley Lane. Pairs were noted copulating after capture. Syrphidae taken included *Episyrphus balteatus* (Deg.), *E. cinctellus* (Zett.), *Stenosyrphus umbellatarum* (F.), *Cartosyrphus scutellatus* (Fall.).

Agromyzidae (complete list of mines taken)—*Agromyza anthracina* Meig. (*Urtica dioica* L.), *A. nana*\* Meig. (*Trifolium* sp.), *A. spiraeae* Kalt. (*Rubus idaeus* L.), *Phytobia flavifrons* Meig. (*Stellaria* sp. and *Saponaria officinalis* L.), *P. labiatarum* Hend. (*Stachys sylvatica* L.), *P. verbasci* Bouché (*Verbascum nigrum* L.), *Liriomyza amoena* Meig. (*Sambucus nigra* L.), *L. trifolii* Burgess (= *congesta* Beck.) (*Ononis repens* L.), *L. sonchi*\* Hend. (*Sonchus oleraceus* L.), *L. taraxaci*\* Hering (*Taraxacum* sp.), *Phytomyza melana*\* Hend. (*Pimpinella saxifraga* L.), *P. agromyzina*\* Meig. (*Cornus sanguinea* L.), *P. atricornis*\* Meig. (*Senecio jacobaea* L.), *P. brunnipes*\* Bricch. (*Sanicula europaea* L.), *P. conyzae*\* Hend. (*Inula conyzia* DC.), *P. ilicis*\* Curtis (*Ilex aquifolium*

L.), *P. lappina*\* Goureau (*Arctium* sp.), *P. obscurella*\* Fall. (*Aegopodium podagraria* L.), *P. pastinacae*\* Hen. (*Pastinaca sativa* L.), *P. sonchi* R.-D. (*Lapsana communis* L.), *P. sphondylii*\* R.-D. (*Heracleum sphondylium* L.), *P. tanacetii* Hend. (*Tanacetum vulgare* L.), *P. tussilaginis*\* Hend. (*Petasites hybridus* (L.) Gaertn., Mey. & Scherb.) and *P. vitalbae* Kalt. (*Clematis vitalba* L.).

Lepidoptera.—*Atolmis rubricollis* (L.), larvae beaten from yew. *Ethmia decemguttella* (Hb.), larvae found on gromwell at Norbury Park. *Coleophora erigerella* Ford, larvae not uncommon on seedheads of *Erigeron acris* L. at the side of the main road near Mickleham; probably a new locality for this species.

A rather uncommon plant, the Greater Burnet Saxifrage [*Pimpinella major* (L.) Huds.] was noted and the member who took a piece home to confirm the identification was pleased to find a larva of *Eupithecia pimpinellata* Hb. feeding on the seeds. A small colony of albino plants of the Red Bartsia, *Odontites verna* (Bell.) Huds. was noticed. Owing to the wet Summer there was more fungus about than usual for the time of year. The more interesting species were:—*Amanita solitaria* (Bull.) Fr., *Tricholoma resplendens* Fr., *Boletus viscidus* (L.) Fr., *B. bovinus* (L.) Fr., *B. luridus* (Schaeff.) Fr., a caespitose bolet thought to be *Gyroporus cyanescens* (Bull.) Quel. and unopened specimens of *Geaster triplex* Jungh.

\*=Empty mines.

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DARENTH WOOD—27th September 1953.

Leader, Mr. S. N. A. JACOBS.

Ten members and visitors attended in a thick river mist which cleared somewhat later.

Dipterous mines were plentiful and as a result of the day's work two species can be added to the British List. Mr. K. A. Spencer's report is appended.

Lepidopterous mines showed *Lithocolletis nigrescentella* Logan to be more plentiful than last year, and oak seedlings were found carrying the distinctive whitish mines of *L. lautella* Zell, three or four in each leaf, while dogwood (*Cornus*) produced many mines of *Antispila treitschkiella* F. & R., the majority with the oval case already cut out and the larva gone, but one or two remained containing feeding larvae.

Golden rod produced *Eupithecia* larvae, also one larva of *Phlyctaenia terrealis* Treits. and cases of *Coleophora virgaureae* Stt., while heads were also found to contain larvae of *Phalonia implicitana* Wocke.

Larvae of *Pheosia tremula* Clerck were found on the aspens and one larva of *Apatele rumicis* L. was seen.

Coleoptera reported were *Leistus spinibarbis* F., *Notiophilus palustris* Duft., *Bembidion lampros* Herbst, *Soronia grisea* L., *Glischrochilus* (*Librodor*) *quadriguttatus* F., *Diphyllus lunatus* F., *Mycetophagus quadripustulatus* L., *M. piceus* F. and *Strophosomus subrotundus* Marsh.

## REPORT BY MR. K. A. SPENCER ON THE AGROMYZIDAE TAKEN.

"Two species were of particular interest and I now consider they can be formally added to the British List. They are:—

1. *Phytomyza solidaginis* Hend. mining *Solidago virgaurea* L. I first found empty mines of this species in Derbyshire in August. At Darenth many mines contained larvae and I now have 7 puparia. Mr. G. C. D. Griffiths has others.
2. *Phytomyza heringiana* Hend. on *Malus* sp. The mines found were empty or contained dead larvae. However, I have had the species from mines found in Berlin in July and there is no doubt about the identification. Mr. Griffiths has found the species in his garden".

Other species found were as follows:—

## MINES WITH LARVAE.

3. *Agromyza alnibetulae* Hend. on *Betula verrucosa* Ehrh.
4. *Phytomyza tremulae* Hering on *Populus tremula* L.
5. *Phytobia posticata* Meig. on *Solidago virgaurea* L.
6. *Ophiomyia maura* Meig. on *Solidago virgaurea* L.
7. *Phytomyza agromyzina* Meig. on *Cornus sanguinea* L.
8. *P. sonchi* Hend. on *Hieracium* sp.

## EMPTY MINES.

9. *Agromyza reptans* Fall. on *Urtica dioica* L.
10. *Phytobia labiatarum* Hend. on *Lamium* sp.
11. *Liriomyza amoena* Meig. on *Sambucus nigra* L.
12. *L. congesta* Beck. on *Vicia* sp.
13. *L. sonchi* Hering on *Sonchus oleraceus* L.
14. *L. pascuum* Meig. on *Euphorbia amygdaloides* L.
15. *Phytomyza atricornis* Meig. on *Sonchus oleraceus* L.
16. *P. cirsii* Hend. on *Cirsium arvense* (L.) Scop.
17. *P. lappina* Gour. on *Arctium lappa* L.
18. *P. sphondylii* R.-D. on *Heracleum sphondylium* L.
19. *P. vitalbae* Kalt. on *Clematis vitalba* L.
20. *Napomyza xylostei* R.-D. on *Lonicera periclymenum* L.

MICKLEHAM DOWNS FUNGUS FORAY—18th October 1953.

Leader, Mr. W. H. SPREADBURY.

Fungi were numerous and in great variety, altogether some 80 species being identified. Particularly worthy of note were the many fine specimens of the Earth-star (*Geaster triplex* Jungh.), some fine masses of *Clavaria cinerea* (Bull.) Fr., the great abundance in the beech wood of the vile-smelling *Marasmius foetidus* (Sow.) Fr. and the numerous specimens of *Psalliota haemorrhoidaria* Karst., a mushroom that 'bleeds' profusely when broken. Two other species of mushroom were found and these together with *Clitopilus prunulus* (Scop.) Fr., *Clitocybe nebularis* (Batsch.) Fr. and some *Boleti* were gathered for the pot.

Few insects were noted but one larva of *Dasychira pudibunda* L., some Spindle-berries containing larvae of the micro, *Alispa angustella* Hb. and 2 imagines of *Oporinia autumnata* Borkh. were taken. Beating yielded nothing of note. 12 members attended the meeting and a welcome tea at the Railways Arms completed the day.

The leader's list of fungi and Mr. G. C. D. Griffiths' list of dipterous leaf-miners are appended.

### FUNGI

*Amanita phalloides* (Vaill.) Fr., *A. muscaria* (Linn.) Fr., *Amanitopsis vaginata* (Bull.) Roze, *Lepiota procera* (Scop.) Fr., *L. rhacodes* (Vitt.) Fr., *L. cristata* (A. & S.) Fr., *Armillaria mellea* (Vahl.) Fr., *Tricholoma fulvum* Fr., *T. saponaceum* Fr., *T. sulphureum* (Bull.) Fr., *T. lascivum* (Fr.) Gillet, *T. terreum* Fr., *T. nudum* Fr., *Clitocybe nebularis* (Batsch) Fr., *C. tuba* Fr., *Collybia radicata* (Rehl.) Berk., *C. butyracea* (Bull.) Fr., *Mycena pura* (Pers.) Fr., *M. polygramma* (Bull.) Fr., *M. galericulata* (Scop.) Fr., *Marasmius peronatus* (Bolt.) Fr., *M. confluens* (Pers.) Karst., *M. dryophilus* (Bull.) Karst., *M. foetidus* (Sow.) Fr., *Pleurotus petaloides* (Bull.) Fr., *Schizophyllum commune* Fr., *Hygrophorus eburneus* (Bull.) Fr., *H. virgineus* (Wulf.) Fr., *H. coccineus* (Schaeff.) Fr., *H. puniceus* Fr., *H. chlorophanus* Fr., *H. psittacinus* (Schaeff.) Fr., *Lactarius torminosus* Fr., *L. blennius* Fr., *L. vellereus* Fr., *L. subdoleis* (Pers.) Fr., *Russula Mairei* Singer, *R. fellea* Fr., *Clitopilus prunulus* (Scop.) Fr., *Pholiota adiposa* Fr., *Hebeloma fastibile* (Pers.) Fr., *H. sinuosum* Fr., *H. crustuliniforme* (Bull.) Fr., *Crepidotus mollis* (Schaeff.) Fr., *Cortinarius multiformis* Fr., *C. largus* Fr., *C. varius* (Schaeff.) Fr., *C. flexipes* Fr., *Stropharia aeruginosa* (Curtis) Fr., *Hypholoma fasciculare* (Huds.) Fr., *Psathyrella conopileia* Fr., *Panaeolus campanulatus* (L.) Fr., *Psalliota silvicola* (Vitt) Sacc., *P. silvatica* (Schaeff.) Fr., *P. haemorrhoidaria* Karst., *Coprinus comatus* Fr., *C. picaceus* (Bull.) Fr., *C. micaceus* (Bull.) Fr., *Boletus edulis* (Bull.) Fr., *B. viscidus* (L.) Fr., *B. chrysenteron* (Bull.) Fr., *B. scaber* (Bull.) Krombh., *Polyporus squamosus* (Huds.) Fr., *P. adustus* (Willd.) Fr., *Fomes ulmarius* Cooke, *Polystictus versicolor* (Linn.) Fr., *Trametes gibbosa* (Pers.) Fr., *Stereum hirsutum* (Willd.) Fr., *Clavaria cinerea* (Bull.) Fr., *C. rugosa* (Bull.) Fr., *Calocera viscosa* Fr., *Auricularia mesenterica* (Dicks.) Fr., *A. auricula-Judae* (L.) Schroet., *Phallus impudicus* (L.) Pers., *Geaster triplex* (Jungh.), *Lycoperdon saccatum* (Vahl.) Fr., *L. gemmatum* Batsch., *Xylaria hypoxylon* Grev.

### DIPTERA.

Agromyzidae:—*Agromyza nana* Meigen (*Trifolium* sp.), *Phytobia labiatarum* Hendel (*Ballota nigra* L., *Lamium album* L.), *P. verbasci*\* Bouché (*Verbascum nigrum* L.), *Liriomyza amoena* Meigen (*Sambucus nigra* L.), *Phytomyza heringi* Hendel (*Fraxinus excelsior* L.), *Phytomyza melana* Hend. (*Pimpinella saxifraga* L.), *P. affinis* Fallén (*Cirsium* sp.), *P. agromyzina*\* Meigen (*Cornus sanguinea* L.), *P. atricornis* (Meigen [*Sonchus oleraceus* L. and *Chrysanthemum parthenium* (L.) Bernh.],

*P. brunnipes*\* Brischke (*Sanicula europaea* L.), *P. cirsii* Hendel (*Cirsium* sp.), *P. conyzae* Hendel (*Inula conyza* DC.), *P. ilicis*\* Curtis (*Ilex aquifolium* L.), *P. lappina*\* Goureau (*Arctium* sp.), *P. obscura* Hend. (*Organum vulgare* L.), *P. minuscula* Gour. (cultivated *Aquilegia*), *P. obscurella* Fallén (*Aegopodium podagraria* L.), *P. pastinacae*\* Hendel (*Pastinaca sativa* L.), *P. pseudohellebori* Hendel (*Ranunculus* spp.), *P. ranunculi* Schrank (*Ranunculus* spp.), *P. ranunculivora* Hendel (*Ranunculus* spp.), *P. sonchi* R.-D. [*Lapsana communis* L. and *Myelis muralis* (L.) Rehb.], *P. sphondylii*\* R.-D. (*Heracleum sphondylium* L.), *P. symphyti* Hendel (*Symphytum officinale* L.), *P. vitalbae* Kaltenbach (*Clematis vitalba* L.).

\*=Mines empty.

## REPORT ON THE XIVTH INTERNATIONAL CONGRESS ON ZOOLOGY

Held at COPENHAGEN from August 5th to 12th 1953.

By the Society's Delegate, BARON DE WORMS.

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After an interval of five years Copenhagen was a particularly happy choice for the venue of the XIVth International Congress of Zoology.

For a week prior to the opening of the Congress proper a special meeting of the International Committee of Zoological Nomenclature took place under the Chairmanship of Mr. A. F. Hemming to revise and modify the Rules. It was well attended by many of the leading authorities on the subject.

The Congress was opened on the morning of 5th August in the great Hall of the University by the President, Professor Spärck of the Zoological Museum in Copenhagen. He gave a very cordial address of welcome to the 675 members and Delegates from 47 countries, including the U.S.S.R. He was followed by the Danish Minister of Finance who in a very fluent speech in English emphasised that Science had no frontiers and called for ever greater co-operation in the field of Research. The leader of the Soviet Delegation, Professor Pavlovsky, then addressed a special note of welcome from his country and scientific colleagues. Professor J. Z. Young then gave an address on "Some thoughts on zoological communication".

After this opening plenary session a large number of those attending went on an afternoon excursion to Elsinore where the famous castle of Kronborg, scene of Hamlet, was visited. In the evening there was a Reception at the Town Hall by the Lord Mayor, who welcomed the Delegates who subsequently were shown over this vast hall and building completed early this century.

The scientific side of the Congress began on the morning of 6th August with lectures on many aspects of Zoology. During five mornings and one afternoon no less than 275 lectures were delivered by 230 speakers in the 16 sections into which the Congress was divided. Most of these papers were well illustrated with either lantern slides or even colour films. French, German, English and Spanish were the official languages. Papers on Entomological subjects were interspersed in such sections as Zoogeography, Nomenclature, Animal Physiology, Parasitology and Invertebrate Morphology. Besides these special sections there was a colloquium on Deep Sea fauna, while three afternoons and two evenings were devoted to the showing of some excellent films. Probably the most spectacular and fascinating was that given by Dr. Bruun, the Congress Secretary, on the Danish expedition in the "Galatea" which spent two years sailing round the world investigating the fauna from the greater depths of the ocean. Films were also shown on wild life in Africa, in Australia and the Antarctic, together with a superb one on Spring in Greenland by Dr. Vibe.

The social and entertainment side of the Congress was also extremely well organised. An evening was devoted to a special visit to the well-known Zoological Gardens which was followed by a Reception at the new Town Hall at Frederiksberg. On the Sunday, 9th August, most delegates took part in all-day excursions to the Island of Moen in South Zealand or to the Island of Bornholm in the Baltic which was reached by air. Both these expeditions were carried out in ideal weather.

The Congress closed on the afternoon of 12th August with a General Meeting in the Festival Hall when a report was submitted by the International Committee of Zoological Nomenclature followed by a closing address by the President and one of good wishes by Prof. Pavlovsky. It was announced that the next Zoological Congress would be held in London in 1958. A farewell Banquet followed that evening after which many delegates went on post-Congress excursions to South Jutland and Islands in the Skagerak.



# TRANSACTIONS

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## THE TECHNIQUE OF ENTOMOLOGICAL DRAWING IN WATER-COLOURS.

By N. G. WYKES.

Read 11th February 1953.

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No doubt there are a few experts who could form an accurate mental image of some insect from a description, but it seems to me unlikely that anyone could describe in words the exact markings of a really complicated design like the underside of the Red Admiral or the outline of the Comma. Therefore, ever since books on butterflies and moths have been published, that is, for the past 200 years, authors and readers have relied on illustrations to convey or collect their impressions. I know very little about the history and development of the various processes of illustration, but you have only to open any book published a hundred or more years ago to see that there have been great changes in more modern times. Before the days of photography the only means of producing coloured figures for any considerable number of copies of a book was by stamping the outline and the darker areas of the insect on the page by one of the numerous methods of engraving, and then handing the book to an artist, or perhaps we should say 'craftsman', to colour. These figures presented the colours of the original in a flat wash, and any attempt to produce the refinements of shading and texture was more or less impossible, since presumably the work had to be done at some speed, and remuneration was probably very inadequate. The invention of colour photography changed all that, and early in the century it became possible to make accurate reproductions by photographing either the original insect or a drawing of it. These reproductions are bound to be accurate to the smallest detail in outline and marking, and at the best in colour also; but almost all that I have seen, even in the most expensive works, suffer from one very serious fault, in that they do not really look like a butterfly or moth, but like what they are—a good photograph of it. The reasons for this are many, but undoubtedly the most important are that, first, the insect has no solidity or depth, and, secondly, the texture of the surface is not what it should be. Many of you may disagree with this view, but I should like to say that this paper deals largely with matters of opinion and taste, and I have no wish to be dogmatic about any of them.

My contention is that there is still, even in the face of the competition of modern scientific methods, a use and a place for original drawings, but that these must be of much more than average quality to serve any useful purpose. What I am going to say about the technique of making drawings is taken entirely from my own experience of thirty-five years; but I should like to pay a sincere and reverent tribute to

the late Mr. F. W. Frohawk, who, when I was eleven years' old and used to watch him at work, encouraged me to persevere with what seemed at that time an impossible task. He taught me the value and excitement of drawing things that I loved passionately, instead of the assorted cylinders, cones, cubes, etc., with which the drawing-master at my private school tried in vain to inspire me—for one term only: after that, we parted by mutual consent and I taught myself, keeping the superlative excellence of Frohawk's drawings as the ultimate, and still distant, goal.

Before discussing in detail the various questions of technique, I must say a word on the vexed question of composition. What is the most effective way of putting the insect on the paper? The choice lies between presenting it as it appears in its natural surroundings and as it appears set out in the cabinet. This problem need not detain us long, since any attempt to show the butterfly in flight or settled with its wings open realistically is almost instantly a failure. It is perfectly possible to show it settled on a flower with its wings closed, but those who try to include the surrounding vegetation as well will waste a great deal of time on what seems to me an unprofitable task. The aim should be to present the picture in its simplest form; otherwise it will become fussy and will lose the essential quality of directness. The eye will be distracted away from the central object of the composition, and the result will be a mean and unmitigated mess. So now to proceed with the construction of our drawing. First we must choose the paper, and that is a matter of the greatest importance. For many years I followed the example of others in using a dead white paper of ivory-smooth finish, but I found this unsatisfactory for two reasons. First, the background of white is hard and insistent to the eye (and we must remember that there is always a great deal of it) and, secondly, it is far more difficult to produce a soft and luminous texture on a perfectly smooth surface. Obviously a rough paper is impossible for fine work, but certainly a slight grain is a great help in taking the paint more smoothly. When I went on to coloured papers there were difficulties of quite a different nature; for even the lightest tinted papers alter the value of colours, and it is no easy matter to present them bright and fresh on a light grey or fawn background. But of this more when we come to the problem of colours, and it is sufficient to say at this point that whenever possible I use a lightly-tinted paper, such as is normally used for pastel work, with a slight grain to it.

Having chosen the paper, we have to construct the figure, and I use the word 'construct', because it is almost entirely a geometrical process. The first essentials are a very hard pencil (3 or 4H) with a long and fine point, and a pair of compasses—an article of equipment which would, doubtless, excite scornful laughter from the professional artist. But as in some species an asymmetry of  $\frac{1}{16}$ th of an inch would produce a gynandromorph, no chances can be taken, and the method I employ is to take two points, one at the top of the thorax and the other at the

base of the abdomen, and transfer the vital measurements to the paper by means of intersecting arcs; thus any point on the wing can be fixed with infallible accuracy, and the two sides must be exactly equal. The next stage is to draw in the neururation, whether it will be visible in the finished product or not. Otherwise the markings, which must be lightly drawn in, will tend to turn up in odd places, and a wing without nervures will look like the bodies without bones which are so fashionable now among our more advanced portrait-painters. The head and antennae come last, and we are ready to go on to the next stage. So far all that we have done has been extremely simple, and I hope you will not think me patronising or arrogant if I say that anyone who takes the trouble to train his eye and his hand can do it.

Here we must interrupt our process for a short time to discuss the question of materials for the second, and, I may say, much more exacting, part of the job. The medium we are to use must, I think, be water-colour. It may be argued that you have only to look at the best of the little Dutch paintings or the great English miniatures to see that the finest work can be done in oils; and the French executed the most delicate and sensitive portraits in pastel. But one can hardly make a collection of butterfly drawings on wooden panels or ivory tablets, and the soft modern pastels, though they produce the most beautiful textures if thickly applied, seem to me frankly impossible for this sort of work. So water-colours, though in the opinion of many authorities the most difficult of the three, must be our medium, but we must have the best available. Before the second war there was still one firm in London which still sold hand-ground colours; but I doubt if it still exists and, in any case, I could never see their superiority over the Artists' (as opposed to students') colours of the best makers. What colours then do we need? There used to be some 250 listed, but I may say at once that most of these, though great fun to play with, are more of a hindrance than a help. First, I will give you ten which are, to my mind, indispensable: aureolin (the purest yellow but rather sticky if used thickly), yellow ochre, burnt sienna, vandyke brown, prussian blue, ultramarine, crimson, scarlet vermilion, ivory black and chinese white, most important of all for reasons I will explain later. With these practically any other colour can be mixed, but for purposes of convenience and for one or two special subjects I would include mauve (which is really bright purple), orange, cadmium yellow, lemon yellow, bright red and cobalt blue, which gives us sixteen in all, as against the twenty-four supplied in the average-sized paint-box, and it might be worth mentioning that for landscape work I hardly ever use more than six. So to brushes. Here, again, we cannot do without the very best, and there is nothing better than red sable. The value of a good brush depends on two qualities: first it must make a good and firm point which does not split when full of paint; secondly, it must have good springy bristles; soft brushes, such as camel or squirrel hair, are quite useless, since it is impossible to paint firmly with them. The best sizes to use are numbers 1, 2, and 3 but, occasionally one needs a 4 or 5 for

the larger tropical insects and, perhaps, a number 0 (the smallest made) for a special purpose to be described later.

Now we will return to our drawing, and I will assume that we are using a lightly tinted paper—an important point to bear in mind, since it is a factor which materially alters our approach to the problem. The reasons for this are, first, as I have mentioned before, that the basic value of all colours is thereby slightly changed; and, secondly, that we must put aside all idea of achieving our effects by transparent washes and must instead employ a technique similar to that known as 'gouache', though we shall not trouble ourselves with the gum or honey with which the masters of this medium are said to amuse themselves. Instead we shall use Chinese White for our body-colour, which will have the effect of laying a coat of more or less waterproof paint on the surface of the paper; otherwise the paper would absorb the paint and the value of the colour would be altered. But Chinese White has a good deal of blue in it, and that still further confuses us in our search for the right colour. So first of all I select what I shall call the basic ground-colour of the butterfly—orange for fritillaries, some blue for the *Lycaenids*, vandyke brown for the *Satyrids*, etc.—mix it with a little white and a good deal of water, and paint over the whole surface, including any white markings, unless of course, these are extensive. This acts as a sort of waterproof undercoat, and prevents the subsequent coats of colour from being absorbed. Next I paint in the neuration (which shows through the undercoat) in the relevant colour, so as to divide the surface of the wing up into small compartments, which are much easier to fill smoothly than larger areas. On this light undercoat are built up the more positive colours—generally a process requiring several washes of gradually deepening tone. Now you will have observed that a butterfly's wing is never absolutely flat; for instance, the surface of the cell is slightly concave, and the neuration is always raised a little above the intervening areas. This means that there must be some variation in tone caused by light and shade—an effect only obvious in a very strong light and only just visible in the smaller insects. Therefore, if the colours are put on with uniform intensity, the wings will appear flat and monotonous, as you may have noticed it always is in drawings of poor quality. To avoid this that part of the interneural areas which is in shadow must be painted darker than the opposite side, and the two tones must be carefully shaded into one another. That sounds easy enough, but in practice there are considerable difficulties. The normal method of doing this in water-colour is to put on the darker part in a wet wash and shade off the colour towards the lighter area by using more water; but one has to be extremely careful with this type of drawing not to put on any wash too wet; for, if one does, it will leave a hard dark line at the edge when it dries out, and nothing short of scrubbing will remove it. Also wet washes are apt to seep through the undercoat of body-colour and bring the butterfly out into acute chickenpox which almost always proves fatal. I am afraid it is not possible to describe accurately the amount of water to be used to effect the right consistency of

wash, since this varies with different colours and with the texture required; but with experience, often painful, one can learn the right amount; it must be just wet enough to dry smoothly, and that is all I can say. Once the wash is on, it must on no account be touched till it is quite dry, which is the first principle of covering any surface in water-colour smoothly and evenly. In this way the colours of the wing are gradually built up to the required intensity, but even so it is likely that our insect will still look as if it is carved out of marble. Now, if you look carefully, preferably through a magnifying glass, at the markings of a butterfly's wing, you will observe that the great majority of these markings are not separated by any hard or clear-cut line, but that the colours are merged into one another. For instance, the black markings of the Fritillaries and Vanessids are mostly bordered by a fringe of minute black dots, and the white markings of the Purple Emperor and White Admiral are sharply edged only on the inner side. Therefore to portray these markings accurately the black areas must first be painted smaller than they really are, and then extended to the natural size by minute stippling. This is done with the smallest possible brush and with the paint as dry as can conveniently be worked. Then the markings will look as if they belonged to the butterfly and not as if they have been stuck on afterwards. But dark colours must always be stippled into light wherever possible. The reverse process is only used in the comparatively rare cases where this is so in nature, as in the blue freckling in the black submarginal band of the Swallow-tail or on the eyes of the Peacock. In these cases the blue paint must be mixed with a good deal of white; otherwise it will not show up on the black at all. The body-colour will prevent the black from absorbing the blue, which will stand out as it does in nature. But this process can only be used for small dots and very small areas, and is, I may say, most exacting and extremely laborious, particularly as more than one application is normally required. There is another use of this stippling method which I discovered during a long series of failures to reproduce the luminous purple sheen on the Purple Emperor. Of course there can be no hope of transferring the iridescence to paper, and the problem is simply to make the central area of the wing a really bright purple. First I tried mixing crimson and ultramarine, but that looked about as bright as a faded Victorian antimacassar. Then I bought the purple paint misleadingly called mauve, and that was far better, though not quite blue enough; but a mixture of the two took away the essential brightness of both. Perhaps what I *should* have done was to buy a minute cake of the *true* (as opposed to French) Ultramarine, which is made of ground lapis-lazuli and costs (or did cost) 30/- a time. But the shop had never heard of it, and instead I bought about a quarter of a pound of poster paint for 6d; it was purplish blue in colour and went by some fearful name which I have at last managed to forget. This was stippled on top of the purple and did give some luminous effect, though of course it falls far short of the brilliance of the original. Since then I have used this technique for many other species, particularly those with a velvet-

black ground colour like the Red and White Admiral. Ivory Black put on thick is a snare and a delusion, since the surface reflects the light and looks like the shiny cuff of a black coat. Under glass it looks somewhat better, but even so it is much improved by a black stippling, if one has the patience to put it on dry and even.

With the aid of stippling, then, the markings of the wings will be complete and will assume the slightly blurred appearance of the original, giving a softness of texture which is the most elusive of all effects to produce. Our next problem is to supply the hindwings, and in some species the forewings also, with their basal plumes—a task which, in many drawings I have seen, has been either ignored or given up as hopeless. Actually it is quite simple, the plumes, which in the original appear to rest on the scales, are literally superimposed on the wing with the aid of body-colour, and the soft downy texture can be given by stroking them with a damp brush when they are dry. This is the secret, too, of the plumes on the body, a part of the drawing which is all too often represented as two flat ovals, and gives the impression that the poor creature was carefully ironed out before being committed to paper. How are we to give the body its third dimension, and make it look as if it had once served some useful purpose in the life of the insect? The answer is obvious. First we put one side of it into shadow by painting it appreciably darker and using some blue in the process; then we also shade the basal area of the corresponding wings, which will bring them to life at once (to use a rather unsuitable metaphor). We then give it a head and a pair of antennae. I have noticed that in some illustrations the eyes are given undue prominence, giving the insect a prawn-like appearance; but careful observation will show that only the upper half of the eyes is visible from a central viewpoint. We shall also see that the head is firmly attached to the thorax and not balanced on it with precarious insecurity. The antennae are, of course, a delicate business and are apt to look like knotted string unless tackled with the greatest care; it is not a job to be done after strenuous exercise. In fact, for some of the smaller insects I use a mapping pen, which will do quite well with paint if not too thick or too wet; but for work other than the antennae I do not recommend it, since it is a hard and uncompromising weapon and often most ill-mannered.

I have often been asked if some form of magnifying glass is an aid to fine work, and I always reply that I think it makes things more difficult. I know that Frohawk, at any rate in the days when I watched him at work, used to sit with one eye to a strong glass and painted under this; but personally I find a glass of any kind a great handicap, as I can only see part of what I am painting, and it seems much more trying to the eyes to keep adjusting the focus between magnified and natural vision. But no doubt those who work at the very small insects find it indispensable, and there is something to be said for the view that what looks good under a glass will look even better to the naked eye.

Finally I should like to point out how much pleasure there is to be got from the execution of such drawings. Many which appear to be most straightforward turn out to be the most awkward. For instance, the upperside of the Ringlet would seem simple enough—just a wash of blackish brown with a pale fringe; but it is not till one starts on the job that one realises that brown is one of the most intractable of all watercolours; it is scratchy if put on too dry and hard as stone if put on too thick and wet; much body-colour converts it into grey, and it must be built up perhaps with 5 coats. In general it is a much more difficult subject than the complicated design of the underside of the Painted Lady. The Blues are another case in point. What would appear easier than a blue ground colour with a few black markings? But try to produce the brilliant turquoise of *bellargus*, the silver sea-green of *coridon*, or the violet-blue of *icarus*, and you will find it an exasperating business till by trial and error you come on the solution, which as I have shown, is simply the use of body-colour. Without it, in my opinion, little can be achieved in entomological drawing. Even the Whites flatter only to deceive. To start with, they are none of them white, and the delicate creams and greys require the most careful handling. On white paper they hardly show up at all, and on tinted paper the necessary body-colour makes them too thick and heavy to give the semi-transparent effect of the originals. But half the fun of the game lies in overcoming these problems, and anyone who is prepared to give the necessary time and care to this most fascinating craft will be well rewarded.



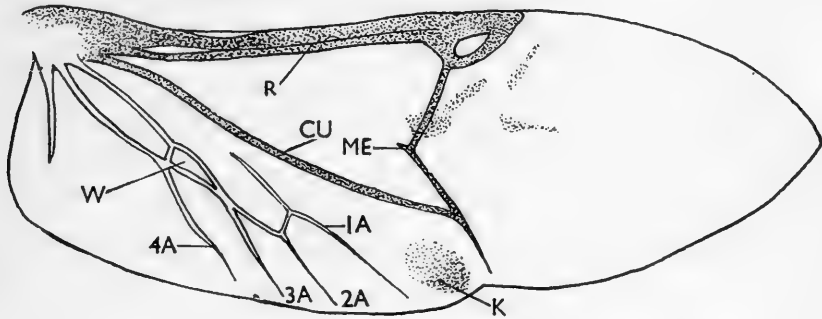
# SOME REMARKS ON THE BRITISH HETEROMERA.

By F. D. BUCK.

Read 8th April 1953.

It is, to my mind, unfortunate that such a large and interesting group of coleoptera should be so poorly represented in these islands. They are but a minor group in our fauna whilst considered in their entirety they constitute one of the largest family series.

According to Crowson (1953) the Heteromera may be characterised in the adult stage as follows:—tarsi 5-5-4-jointed in both sexes, or 4-4-4-jointed (or 3-4-4-jointed, very rarely 3-3-3-jointed); anterior coxae usually projecting, if not trochanters usually of heteromeroid type and first three visible abdominal sternites connate; aedeagus never of typical Cucujoid type, usually of characteristic Heteromeroid type (figs. 2 and 3); wings never with more than four anal veins in main group (fig. 1); met-endosternite usually with narrow stalk and anterior tendons arising from the arms (fig. 4); abdomen with seven pairs of spiracles; maxillae bilobed.



AFTER CROWSON

Fig. 1. Right wing of *Tetratoma fungorum* F.; 1A, 2A, 3A, 4A, anal veins; CU, cubitus; ME, media; R, radius; W, anal cell.

It is proposed in this paper to deal only with that portion of the Heteromera with the tarsal formula 5-5-4, that is, the Heteromera as derived from the classification based on the construction of the tarsi developed by Latreille, Erichson, Lacordaire and Duval. They are a loosely knit series of which the following sixteen families are found in Gt. Britain and Ireland:—Tenebrionidae, Alleculidae, Lagriidae, Tetratomidae, Melandryidae, Mordellidae, Scraphiidae, Salpingidae, Mycteridae, Pythidae, Pyrochroidae, Oedemeridae, Anthicidae, Aderidae, Rhipiphoridae and Meloidae. The excluded families being the Colydiidae and Mycetophagidae. These families, and indeed some of the genera within these families, are very diverse in appearance. A comparison



of such species as *Tenebrio molitor* L. (Tenebrionidae); *Tomoxia biguttata* (Gyll.) (Mordellidae); *Meloë proscarabeus* L. and *Lytta vesicatoria* (L.) (Meloidae); *Aderus populneus* (Panz.) (Aderidae); *Pyrochroa coccinea* (L.) (Pyrochroidae); *Rhinosimus ruficollis* (L.) (Pythidae); and *Oedemera lurida* (Marsh.) (Oedemeridae) will illustrate adequately these differences of appearance.

Several attempts have been made in the past to break down the Heteromera, the most notable was by Dr. Charles Leng who in 1920 used in the place of the Heteromera the super-family Tenebrionoidea which contained the Alleculidae, Lagriidae, Tenebrionidae, Melandryidae (with which he combined the Scraptiidae) and Monommidae which is not represented in the British Isles. The remaining families which concern us he placed in a new super family, Mordelloidea. This he separated widely from the Tenebrionoidea. Leng did not appear to be satisfied with the position of the Mordelloidea and later, when discussing the Tenebrionoidea suggests that it may eventually prove necessary to position these two groups closer together.

Sharp and Muir, in their work on the genitalia of the coleoptera have broken down the Heteromera into Tenebrionoidea, containing the Alleculidae, Lagriidae and Tenebrionidae, and places the remaining families into the Cucujoidea into which they also put all the families that cannot be accommodated within the following super families:—Byrrhoidea (Serricornia), Caraboidea (Adephaga), Staphylinoidea, Malacodermata, Tenebrionoidea, Scarabaeoidea, and Phytophagoidea (which includes the Rhynchophora besides the Phytophaga and Longicorns). They have, of course, only considered the male genitalia and are uninfluenced by other considerations, also they were aware that further research must be done on their Cucujoidea.

In the most recent work on the classification of coleoptera Crowson keeps the Heteromera intact and considers them a sub-division of the Cucujoidea. He has included the Colydiidae and Mycetophagidae, and made several changes in the families which we have usually recognised as Heteromerous. From the Melandryidae the tribe Tetratominae has been raised to family status; the Pythidae has been restricted, as far as we are concerned, to the genus *Pytho* and the excluded genera are considered as Salpingidae with the exception of *Mycterus* which has been placed in its own family—Mycteridae; finally the genus *Anaspis* belongs, according to this classification, not to the Mordellidae but to the Scraptiidae.

#### LARVAE.

The larvae of the Heteromera can be divided into three distinct groups:—

- (1) Those of a regular cylindrical shape with a hard integument and without pseudopods. (Tenebrionidae, Alleculidae, Lagriidae). Similar in appearance to the Elateridae. (Figs. 5 and 6.)
- (2) With a soft integument (more variable in form) often with

pseudopods. (Oedemeridae, Pythidae, Pyrochroidae, Anthicidae, Mordellidae, Serropalpidae, ? Aderidae and ? Scaptitidae)—some of the species which are to be found in timber may be mistaken for longicorns. (Figs. 7, 8 and 9.)

- (3) Those undergoing hyper-metamorphosis, the first instar being campodeiform and becoming modified with ecdysis (Meloidae and Rhipiphoridae). (Figs. 10, 11 and 12.)

In most species the larvae and imagines may be found in the same situations, though in certain genera the larvae seldom appear to be noticed or recognised when seen; for instance, the writer has often bred *Anaspis*, from wood in which other beetles were being reared without being aware of the existence of these larvae within the wood. On the other hand it has been my experience to find the larvae of *Pseudocistela ceramboides* (L.) and *Prionychus ater* (F.) far more often than the adult.

#### TENEBRIONIDAE.

The Tenebrionidae have the anterior coxae globular and not projecting (fig. 13), the tarsal joints without lobes (fig. 14), the antennae inserted under a small ridge on the side of the head which encroaches on the eye (fig. 16), and the anterior coxal cavities closing behind (fig. 17).

Of all the families in the Heteromera this is the most important, not only because of its size but primarily because it contains a number of species affecting stored foods which in themselves are quite a large economic factor. These are all contained within the tribes Ulominae and Tenebrioninae with the exception of *Alphitophagus bifasciatus* (Say.) which is taken in old flour but does occur in other situations such as hedge cuttings, under boards in the open, in *Polyporus squamosus* Huds., under dead leaves in manure heaps, under the bark of rotting birch, and I have taken it in haystack refuse. Its interest in old flour is most likely the fungoid content and fungus would account for most of the other situations, though Dr. Blair (1949) took care to point out there was no fungus present when he took specimens under dead leaves.

With the exception of *Hypophloeus* all the Ulominae are of economic importance—mainly on cereal products, whilst in the Tenebrioninae only the two species of *Tenebrio* infest grain and flour. Many of these insects notably *Gnathocerus cornutus* (Fab.) and *Tribolium castaneum* (Herbst) do a considerable amount of damage. As is well known these economic species are spread as the products which they infest are shipped from country to country. Thus we have nine cosmopolitan species and three recent introductions which now appear to be established. Among the casual immigrants are *Sitophagus hololeptoides* Cast, and two species of *Lyphia*, *L. orientalis* Blair and *L. depressa* Hinton.

The members of the remaining Ulomid genus *Hypophloeus* are parasitic on bark beetles. *H. bicolor* (Ol.) is taken in the burrows of the Elm bark beetles (*Scolytus scolytus* (Fab.) and *S. multistriatus* (Marsh)); *H. linearis* F. in the burrows of *Pityogenes bidentatus*

(Herbst); and *H. fraxini* Kg. in the burrows of *Ips sexdentatus* (Boer.) and *Onthotomicus laricis* (F.). I have no particular records for *H. unicolor* (P. & M.).

It has been suggested to me that *H. bicolor* (and I assume the other species are included) is not parasitic at all but feeds on the fungus in the burrows. The basis for this suggestion is, I believe, the existence of specimens in very old burrows. I cannot subscribe to this view. I have, on a number of occasions, taken *H. bicolor* and *H. fraxini* in large numbers in very fresh burrows of *Scolytus scolytus* and *Ips sexdentatus* respectively in which I have seen no sign of fungus and certainly not sufficient to support so many insects. It is far more likely that those specimens found in old burrows have preyed upon other forms of invertebrate life.

Inhabiting old houses, stables and out-houses is the genus *Blaps*, to my mind the most objectionable of beetles, sluggish in movement, with noisome odour and unpleasant to handle. They like dark and damp situations and are known to many as "Cellar" and "Church-yard" beetles. *B. mucronata* Latr. is quite common, *B. lethifera* Marsh. quite scarce and *B. mortisaga* (L.) is probably not indigenous.

A number of species are to be found in maritime sandhills, *Phylan gibbus* (F.) and *Melanimon tibialis* (F.) may be found on almost any sandhill on our coast by shaking the marram grass. They may also be taken in the, usually narrow, transitional strip of ground between the sandhills proper and the rough ground behind them. Under carcasses, boards, sacks and seaweed one may find *Phaleria cadaverina* (F.). I have usually encountered this insect on the seaward side of the hills near the line of rubbish which indicates high-water mark.

Other maritime species are *Opatrum sabulosum* (L.), *Crypticus quisquilius* (L.) and *Cylindronotus pallidus* (Curt.). The latter I have only found in single specimens and I have been told the way to take this species is by digging well below the roots of the marram grass. Fowler confirms this, but I have put in many hours of unsuccessful work in this way, except in one instance when just prior to leaving the Croyde sandhills I put in ten minutes digging and secured the only specimen I have not acquired by accident—unfortunately it only inspired me to subsequent hours of unsuccessful work.

Several of these coastal species have been taken in inland localities, *Crypticus quisquilius* (L.) at Freckenham and Tubney, Berks.; *Opatrum sabulosum* (L.), Coversham, Berks.; and *Melanimon tibialis* (F.) also from Tubney are examples; no doubt there are many others.

Fungus is the pabulum of those species which make up the tribes Bolitophaginae and Diaperinae. The former tribe consists of two species *Bolitophagus reticulatus* (L.) which is confined to Scotland and *Eledona agaricola* (Herbst) which, though widely distributed, is very local but often occurs in great numbers in Boleti and Polyporus. The Diaperinae contain two very rare species, *Diaperus boleti* (L.) and *Platedema violaceum* (F.), this latter being only recorded from the New Forest.

Perhaps our commonest Tenebrionid is *Cylindronotus laevioctostriatus* (Goeze) which occurs under bark, at the roots and about trees, it often comes to light and I have had specimens brought to me which came to light. This is quite interesting—all the beetles which I know to be taken at light have ample wings and can fly to it, but this insect has very small wings which I doubt could support its body in flight. It may be that this species, like *Crypticus quisquilius* has the development of the wings varying from specimen to specimen, but one specimen I dissected which Mr. D. A. Odd took at light had very small wings (fig. 15).\*

An Allied species *Helops coeruleus* (L.) is also associated with timber and though sometimes recorded from inland localities appears to be more of a maritime insect than otherwise.

#### ALLECULIDAE.

The pectinate tarsal claw (fig. 18) is about the only character which divides the Alleculidae from the Tenebrionidae, except for this they could quite well form part of that family.

Only two of our species may be considered common, the others unless specially worked for, or the right localities visited are unlikely to be taken. The two common species are *Gonodera luperus* (Herbst) and *Isomira murina* (L.) both occurring in some numbers on hawthorn blossom in the spring. Both too, are very active insects, as indeed are all our Alleculidae, particularly *G. luperus*.

I have found the larvae of *Pseudocistela ceramboides* (L.) far more plentiful than the imagines. It is to be found in its immature stages in the rotting wood mould of hollow oaks and in the wood mould in the crowns of rotting oaks. Provided the humidity of its habitat is maintained it is quite easy to rear, but the larvae die very quickly if the wood mould is allowed to dry. The adult beetle is to be taken in spring and early summer but seldom in numbers.

Another species inhabiting a similar situation is *Prionychus ater* (F.). This insect however seems to prefer ash, though Donisthorpe (1939) has taken the larvae in oak in Windsor Forest. Due to its nocturnal habits it is also more readily found in the larval stages. These larvae may be distinguished from the preceeding species by being less greenish in colour and, in the later instars, by the larger size. It is an interesting insect to breed, the larva constructs a pupal cell with an outer channel, which, as far as I am aware, is done by no other species in this family. I have had no experience of our other species *P. fairmairei* Reiche which has an extremely limited distribution and though it has been taken elsewhere most of our specimens come from Sherwood Forest.

*Otenopus sulphureus* (L.) is a coastal species and may be taken plentifully in those localities where it occurs. It has a fairly wide

\*A number of specimens have been dissected since the above was written showing no marked variation in the size of the wing, Buck (1954, *Ent. mon. Mag.*, 90 : 118).

distribution in the Southern half of England and Wales but most of the records are from Kent and the West Country.

An extremely scarce insect is *Omophlus rufitarsis* (Leske), it is often referred to as maritime, probably this is due to the fact that most of the few specimens taken in England have been from the Weymouth area. Reitter makes no reference to the species as maritime and in the O'Mahony collection there is a specimen from the New Forest.

#### LAGRIIDAE.

The species may be recognised by the somewhat projecting anterior coxae; the anterior coxal cavities closed behind and the narrow prosternal process (fig. 19); and the thorax being margined laterally (fig. 20), broadest at the base and with a depression in the centre at the base; also by the not very prominent middle coxae (fig. 21).

Until recently there was but a single species representing this family in the British fauna—*Lagria hirta* (L.), a dull, not very attractive insect, taken in hedgerows and the more open countryside, often quite common on sandhills.

In 1948, Allen added *Lagria atriceps* (Muls. and Guilleb.) to our list from E. Kent. He showed how his Kent specimens were connected with the species Mediterranean habitat by records from Rouen. Since then the only recorded captures of this species are from E. Kent woods, thus the insect seems to be at its extreme northern range in this corner of Kent. As distinct from *L. hirta*, *atriceps* is taken in woodland and differs among other things in being larger, having a slightly brighter coloration and larger and more deeply incised eyes.

#### TETRATOMIDAE.

This family has the prothorax with well marked side borders (fig. 22); anterior coxal cavities open with lateral extensions (fig. 23); antennae with a strong 4 jointed club; maxillary palpi not securiform; anterior coxae transverse (fig. 24).

The genus *Tetratoma* which represents this family in Britain is fungicolous. The commonest species is *T. fungorum* F. which may be found on almost any *Polyporus* spp. and is exceedingly wide spread; though I know of no records from Ireland I can see no reason why it should not occur there also. *T. desmaresti* L. and *T. ancora* F. are the remaining species in our fauna, neither of which can be considered common though found in similar situations to *T. fungorum*.

Crowson believes the tarsal formula to be the only important character separating this family from the Mycetophagidae.

#### MELANDRYIDAE.

The more or less globular anterior coxae (fig. 25) and serrate tibial spurs are the characters which separate this family most satisfactorily from the Tetratomidae.

Species of this family are lignicolous or fungicolous and are very diverse in form. Among the species which may be found in fungus is

*Orchesia micans* (Pz.) an extremely active insect with enlarged hind femora which enables the beetle to skip about in a most erratic manner. Its fat, pink larvae are almost as well known as the imago and when fully grown appear much larger than the adult. The species of fungus in which *O. micans* has been found include *Polystictus radiatus* (Sowerby) Fries., *Polyporus giganteus* Fries., *P. dryadeus* (Persoon) Fries., and *Fistulina hepatica* (Hudson) Fries.

From the records (Gimingham 1922, Lyle 1926 and Morley 1922) it appears to be among the most parasitised of our coleoptera, the following species being bred from it:—*Meteorus obfuscatus* (Nees) and *Euphorus orchesiae* (Curtis) (Braconidae); *Cryptoserphus parvulus* (Nees) and ? *Proctotrupes parvulus* Nees (Proctotrupidae); and *Thersilochus orchesiae* Morley (Ichneumonidae).

Another species to be taken in fungus is *Hallomenus binotatus* (Quen.). Though not common it is widespread and often taken in plenty when found.

*Zilora ferruginea* (Payk.) is another fungicolous beetle, only to be taken in Scotland from *Polystictus abietinus* Fries. on Scots pine. The records point to a restricted distribution in Inverness-shire.

The Melandryid inhabiting timber most often seen is *Melandrya caraboides* (L.) which in some localities is extremely common. Several species of timber may support this insect—Birch, Oak, Ash, Willow, Sallow and Beech. Its congener *M. barbata* (F.) is quite a rarity and with few exceptions appears to be confined to the New Forest. A third species, *M. dubia* (Schall.), has from time to time found its way on to our list, but this has been due to error. The last instance being a record by J. J. Walker whose specimen is obviously *M. barbata*.

*Phloeotrya rufipes* (Gyll.) is a local species and not usually taken in large numbers but is also found in many different species of trees. It is, like many wood-feeding insects, subject to considerable variation in size, from 8 to 14 mm., but does not vary much in either structure or colour.

An interesting species on account of the sexual dimorphism is *Osphya bipunctata* (F.) which can best be taken where it occurs by beating hawthorn blossom. The male is black with the front of the head, margins and median line of the thorax yellowish and normally with the posterior femora strongly enlarged; the female has brownish-red elytra with the apex dark, the thorax reddish with two black spots (which are sometimes absent) and the posterior femora are simple. Males do occur, and they are usually small specimens, with simple femora and though the markings of the thorax vary considerably in both sexes, dissections show that the colour of the elytra is a more reliable guide to sex than the incrassate femora of the male.

#### SALPINGIDAE.

The Salpingidae have the anterior coxal cavities open (fig. 26) and the anterior coxae themselves conical and contiguous (fig. 27). They have the thorax narrower than the elytra and unimpressed on the disc;

the intermediate coxal cavities closed outwardly by sterna (fig. 28); and tarsi without lobed segments (fig. 29).

This family contains mainly predaceous beetles found under the bark of various trees or in association with dying or damaged trees. *Vincenzellus* and *Rhinosimus* species are all quite common under bark and have a wide distribution, turning up in almost any locality where search is made for sub-cortical species. The species of these genera have the head produced into a rostrum and have a considerable likeness to the Curculionidae, however they may be readily separated by the ungeniculate antennae.

Both the species of *Lissodema* are uncommon, *L. cursor* (Gyll.) is quite rare and is associated with Ash. *L. quadripustulata* (Marsh.), by no means a common insect in the writer's experience, has occurred on a variety of trees including Sycamore, Elm, Hawthorn and Holly besides Ash, but can on occasions be swept beneath these trees. A third species has, at times, appeared in our lists, *L. kirkae* Donisthorpe, but Dr. K. G. Blair showed this to be synonymous with *L. cursor* in 1928 in the Junk Col. Cat. Unfortunately this remained un-noticed by British coleopterists until the present writer (1952) drew attention to it.

Dr. Blair was also responsible (with two papers in 1918 and 1925) for clearing up the tangle of synonymy surrounding the genera *Rabocerus* Muls. & Rey and *Salpingus* Ill. The species of these genera most frequently taken by the coleopterist in the South of England are *Salpingus castaneus* (Panz.) which is beaten from pine and *S. ater* (Pk.) which, though often beaten from dead twigs occasionally is found in great numbers on burnt twigs and branches.

#### MYCTERIDAE.

This family can best be separated from the Salpingidae by the tarsi which have the penultimate segments bilobed (fig. 30).

The very rare *Mycterus curculioides* (F.) is the only species representing this family in our list, it should occur on Umbelliferae though I am aware of no modern records.

#### PYTHIDAE.

In its restricted sense the Pythidae can best be distinguished from both the Salpingidae and Mycteridae by the mesosternum on which the intermediate coxal cavities are not closed outwardly by the sterna (fig. 31).

The only British species in this family is *Pytho depressus* (L.) which according to our records appears to have a very restricted distribution in Scotland, though I believe this is most likely due to coleopterists preferring a known locality when visiting Scotland rather than risk disappointment in breaking new ground. If the bark of Scots pine is examined further afield I do not doubt its range in the Scottish Highlands would be found to be more extensive than our present meagre records tend to show.



## PYROCHROIDAE.

The species of this family are depressed, with serrate or pectinate antennae (fig. 33), the head which is strongly constricted at the base is horizontal with eyes emarginate (fig. 34), the anterior coxal cavities are broadly open behind (fig. 35). They are closely allied to the Pythidae as the mesosternum will show (fig. 32), and can be separated from them by the shorter prosternum, the penultimate tarsal segment being bilobed, and the radial cell of the wings being open.

They are well known to nearly all naturalists collectively as "cardinal beetles" and it is indeed a most suitable name since these insects are a brilliant scarlet in colour. On hot sunny days they are often seen on the wing and sitting in blossom, but if a log in which they are breeding is stripped of bark they may be found in plenty, together with their rather grotesque larvae in various stages of development.

*Pyrochroa serraticornis* (Scop.) is no doubt our commonest with a wide distribution in the southern half of England, its congener, *P. coccinea* (L.), distinguished by its black head, is just as widely distributed, and though logs containing this species are less frequently encountered, the insect is just as plentiful when such a log is found.

Our remaining species, *Schizotus pectinicornis* (L.), is usually taken in Scotland, but is not entirely confined to that country being recorded on more than one occasion from Herefordshire. The antennae are more pectinate in both sexes than either of the *Pyrochroa* spp. and this insect is somewhat duller in appearance.

## MORDELLIDAE.

A family of delicate insects of characteristic shape (fig. 36), tarsal claws serrate with bristle-like lobe beneath (fig. 37); abdomen produced into a style (fig. 36); head strongly deflexed, terminal joint of the palpi securiform, and with long spines at the apex of the hind tibiae.

They are extremely active creatures, most prolific in the spring and early summer when many species can be beaten, often in great numbers, from hawthorn and other blossom. Some of the *Mordellistena* are sometimes more plentiful on the flowers of Compositae, particularly the yellow flowers of the Hawkweeds (*Hieracium*), while *Tomoxia biguttata* (Gyll.) may be captured at the right period ovipositing on trunks and stumps of many species of trees; it has been recorded from birch, oak, willow and beech, though the latter seems to be most favoured.

The larvae of the Mordellidae feed in timber and in plant stems. Whether timber species all confine themselves to timber and plant stem species to plant stems seems to be doubtful. Westwood records a continental species (*Mordella pusilla*) being found abundantly in the stems of *Artemisia vulgaris* L., while Mr. G. R. Waterhouse reared it from some rotting wood placed in the breeding cage without the knowledge that it contained *Mordella* larvae. He also mentions that Monsieur Vallot found these larvae in the stems of *Marrubium vulgare* L.



## SCRAPTIIDAE.

In the Scraphtiidae the tarsal claws are simple and the abdomen is not produced into a style.

All three species of the genus *Scraptia* are rare and very seldom encountered. They are associated with rotting wood of various kinds, Donisthorpe (1939) records brushing *Scraptia fuscula* Muel. (which most likely is *S. testacea* Allen) from the inside of hollow trees; he also quotes Fowler as saying that to a certain extent it is myrmecophilus.

The majority of the *Anaspis* species are common and widely distributed, especially in the spring when they are beaten from blossom in great numbers. They are very delicate insects and extremely active. Although not all the species in this genus are typically black a black specimen has been recorded for a number of the differently coloured species.

This family though closely allied to the Mordellidae has also a close affinity to the Anthicidae.

## OEDEMERIDAE.

The elytral cuticle in these insects is soft, the head is without a neck (fig. 40), the middle coxae are very prominent (fig. 41), the penultimate joint of the tarsi bilobed (fig. 38), and the anterior coxal cavities are open behind (fig. 39), and the eyes emarginate.

Our Oedemeridae, with the exception of *Oncomera femorata* (F.), are found most plentifully in their perfect state in spring and mid-summer. By sweeping and beating blossom two species of the genus *Oedemera* may be taken quite plentifully, *O. nobilis* (Scop.) and *O. lurida* (Marsh), they are extremely active insects and will fly readily. The former will be well known to field workers in all orders for its brilliant metallic green coloration and the incrassate hind femora of the male. In localities where it occurs the same methods of collecting will often produce the *Ischnomera* species, whose larvae have been recorded from the rotten wood of many species of trees including fruit trees.

An interesting species from a distribution point of view is *Nacerdes melanura* (L.), which at one time was considered to be mainly a maritime species feeding in the timber of pier piles, quays, groins, docks, etc., and indeed it often occurs in large numbers in such situations, but has since been found in a large number of inland localities—Chatteris, Cambs.; Dorking, Croydon and Weybridge, Surrey; Windsor Forest, Berks.; New Forest, Hants.; Colchester, Essex; Manchester, Lancs.; and many other localities. In London the species has been recorded from a great many districts as far apart as St. Pancras, Hampstead, the Strand, London Docks, Bayswater, Kensington, and Lincoln's Inn.

One of our scarcer Oedemerids is *Oncomera femorata* F. which does not appear to occur farther north than Lancashire. It is not a very striking beetle and probably most likely to be taken in the autumn on Ivy blossom at dusk. Unfortunately this is just the time when Ivy blossom is most attractive to wasps and working for *O. femorata* is by no

means an easy or pleasant task. Several instances are to be found of this species at sugar and G. S. Kloet (1942) records the capture of a specimen at light at Rhos on Sea, Denbigh, by R. B. Copley.

#### ANTHICIDAE.

These insects may be recognised among the Heteromera by the mes-episterna meeting in front of the meso-sternum (fig. 42), the head with a neck, the thorax narrower than the elytra (fig. 43), constricted at the base, eyes small, entire and coarsely granulate (fig. 46), the penultimate tarsal joint bilobed (fig. 48), the posterior coxae separated by a projection of the abdomen (fig. 44).

The greater part of our Anthicidae must be looked for on the coast, some amongst sandhills, others in salt marshes. The sandhill species include *Anthicus antherinus* (L.) and *Notoxus monoceros* (L.) both of which can usually be shaken out of the roots of Marram grass on any sandhills. Neither of these species can be regarded as strictly maritime though they usually prefer a sandy locality. The latter has been beaten on occasions at Clandon, Surrey, and has been recorded by Ashe commonly on willows, while the former occurs inland in similar situations as *A. floralis* (L.) and *A. quisquilius* Thoms., in vegetable refuse, heaps of cut grass, manure heaps and haystack refuse.

In salt marshes one can expect to obtain five species—*A. angustatus* Ct., *A. tristis* Schmidt, *A. instabilis* Schmidt, *A. salinus* Crotch, and *A. constrictus* Curt., the last named is particularly common at times on the Thames estuary where it can be swept off herbage on the banks of tidal ditches or taken running on the mud just above high water mark. *A. instabilis* Schmidt is noteworthy for the spatulate hind tibiae in the male. A further species occurring in these situations in the extreme north of England, in Scotland and in parts of Ireland is *A. scoticus* Rye.

In addition to the non-maritime species already mentioned in the remarks on *A. antherinus* (L.), there are two other scarcer species. *A. bifasciatus* (Rossi) which has been taken most often in Cambridgeshire, favours manure heaps but has also been taken in grass heaps. The second, our most recent addition to the Anthicidae, is *A. tobias* Mars. which I believe originated in the Middle East and since its discovery in England by Bedwell at East Malling, Kent has been reported from a variety of localities, mainly in the S.E. but has been taken as far north as Lancashire.

#### ADERIDAE.

These differ from the Anthicidae in having minute penultimate tarsal joints (fig. 49) and large eyes which are notched (fig. 47), and the mes-episterna broadly separated by the meso-sterna (fig. 45).

They are another family but poorly represented in this country by three species which are associated with rotten wood of various kinds, but can on occasions, be swept beneath trees. The writer's only experience with this family is that of taking *Aderus populneus* (Panz.) in

Panz.) among the decaying wood mould of an ash which had to be sifted very carefully before the insects were found. *A. pygmaeus* (Deg.) is another species which Donisthorpe (1939) records being brushed from the inside of hollow trees. The third species, *A. brevicornis* (Perris), is an extremely rare beetle and only a few specimens exist in British collections.

#### RHIPPIPHORIDAE.

The thoracic margin in this family does not form a sharp ridge, the antennae are bipectinate in the male and serrate in the female (fig. 50), the elytra are divergent at the apex, and the tarsal claws are serrate and without appendages.

*Metoeus paradoxus* (L.), which is the only representative of this family in these islands, is a very distinctive beetle having a life history which resembles that of the Meloidae in as much as it undergoes hyper metamorphosis. In this instance the larvae are parasitic on the wasps, *Vespa vulgaris* (L.) and *V. rufa* (L.). The imago is quite scarce, on rare occasions it is found on flowers and its scarcity is probably due to the obscure habits of the creature. As many as 24 have been taken from a single nest though two or three is the usual number.

The sexes of this species differ in coloration and in the form of the antennae, the male has the antennae bipectinate and the elytra testaceous with the apex black, while the female has the antennae simply pectinate and the elytra black with the base yellow. The thorax is deeply sulcate in both sexes.

#### MELOIDAE.

The characteristics of this family are as follows:—Head with a neck (fig. 51); tarsal claws with long appendages beneath (fig. 52); thorax at the base much narrower than the elytra at the shoulders; the latter, except in the genus *Lytta* reduced and divergent at apex; maxillary palpi not or only slightly securiform.

This extremely interesting family contains the Oil beetles (*Meloe* spp.) and the Blister beetle (*Lytta vesicatoria* (L.)). The life history of the former is most unusual and an excellent account is given by Reitter (1911). He says the eggs are laid in April during a three to four week period. They are laid in a dry sunny situation in small excavations in the earth, in small heaps and covered again with earth. After four or five weeks a small louse-like larva (fig. 10) emerges with long antennae and legs, and with two long anal bristles. It is, therefore, very unlike other beetle larvae which caused Fabricius to describe this instar as *Pediculus apis* and Dufour, because of the three clawed tarsi, as *Triungulinus andrenetorum*—these larvae in their first instar are still known as triungulins. At this stage the larvae are very active and climb up the nearby plants onto the blossom (particularly Compositae). The triungulin lies in the blossom in wait for visiting bees of the genera *Anthophora* Lat., *Andrena* Fab., *Eucera* Scop., *Osmia* Panz., *Halictus* Lat., *Colletes* Lat., and *Nomada* Scop., on which it seizes and

allows itself to be carried to the nest of the bee. They do occasionally attach themselves to flies and other insects sufficiently hirsute to pass for a bee, in which event obviously they do not survive the first instar.

The larva enters a cell in the nest when the bee lays the egg and proceeds to devour it. By the time the egg is consumed the larva has approximately doubled its size and undergoes ecdysis for the first time. There is little resemblance between the triungulin and the second instar, and in this new form it feeds on the honey in the cell in which it is immersed. It thus becomes fat, bloated and arched ventrally (fig. 11). When the honey is exhausted the larva becomes inactive and passes the winter in a torpid state. This state is referred to by most authors as the pseudo-pupa (fig. 12).

A third larval form emerges from the pseudo-pupa differing from both the previous forms, being convex dorsally and flat ventrally and is followed by a true pupa which, as is usual in the coleoptera, is very like the imago.

The adults of this genus can be taken on grassy banks and in meadows. Most frequently met of the species of the genus *Meloë* are *M. violaceus* Marsh. and *M. proscarabeus* L. The remaining species are quite scarce or of very limited distribution.

*Lytta vesicatoria* (L.) is quite distinct from any of our other *Meloidae* in having entire elytra and with the exception of *Apalus* Fab. (= *Sitaris* Lat.), ample wings; its coloration, brilliant green sometimes with a reddish reflection, will also readily distinguish it. Normally it is not a common insect though on occasions it has been seen in large numbers about ash trees with which it appears to be associated. Even so, the beetle is quite widely distributed over Southern England. This species is of some importance medicinally, being used as a counter-irritant.

The life history of *L. vesicatoria* is very obscure, but it is known that the first instar is a triungulin as is that of the other members of the *Meloidae*.

*Apalus muralis* (Forst.), has a similar life history to *Meloë* species, but is probably better known and, unlike *Meloë*, the imago is winged.

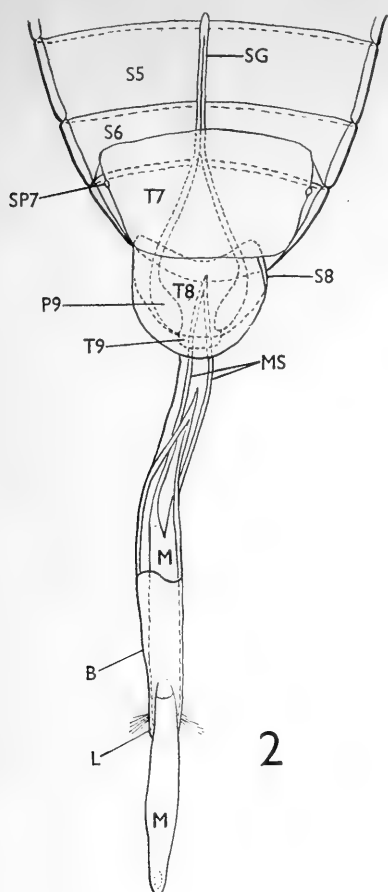
#### ACKNOWLEDGMENTS.

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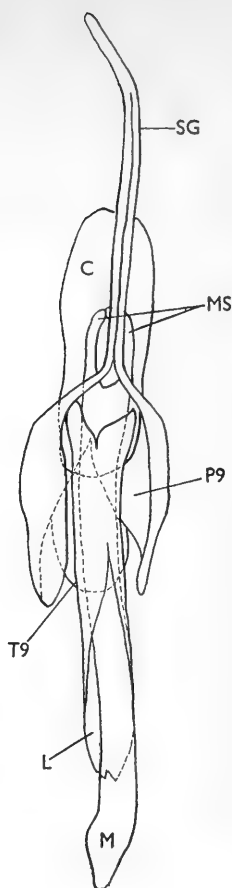
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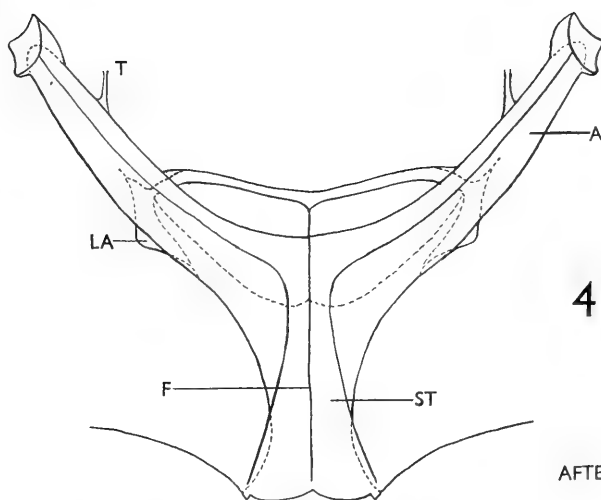
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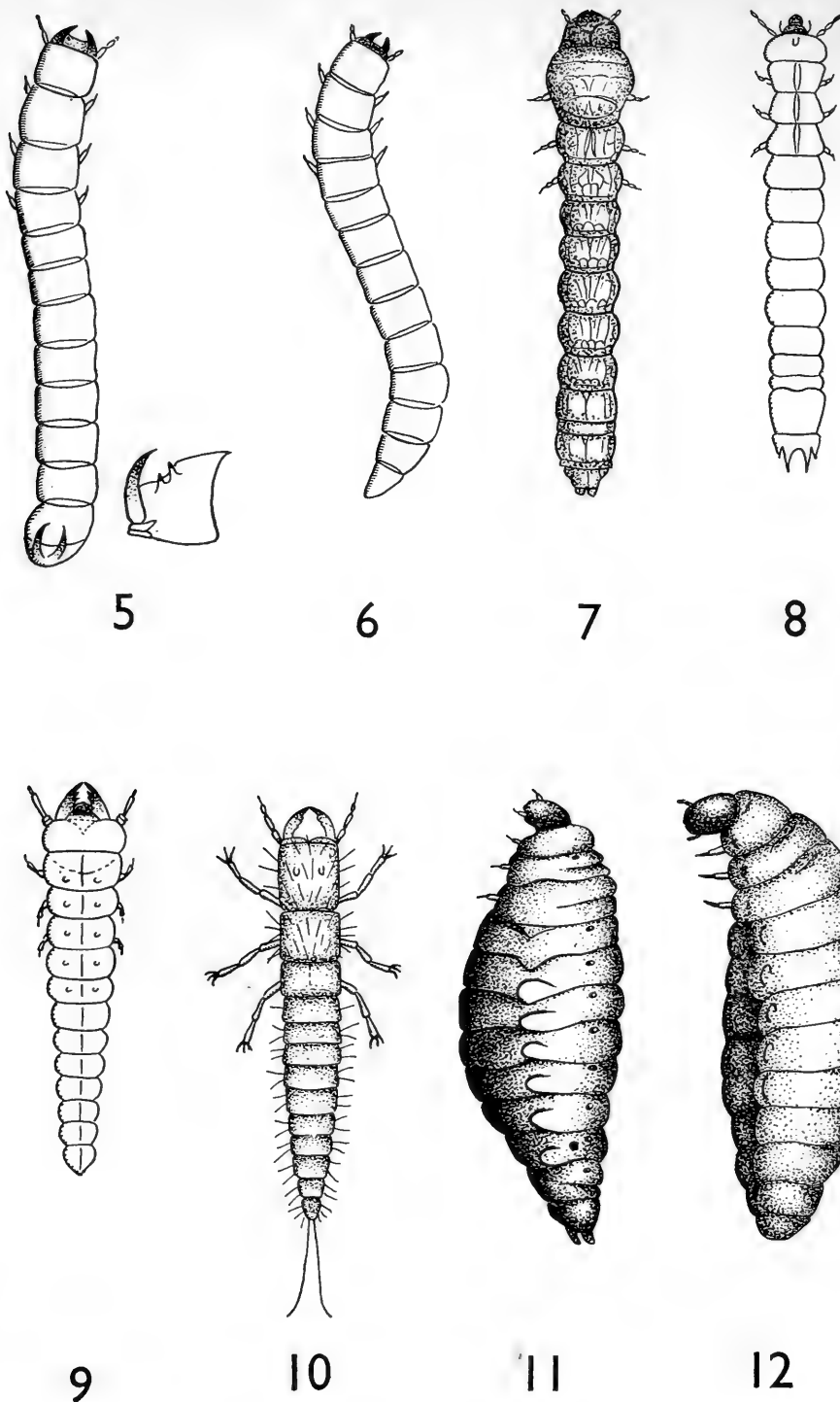


4

AFTER CROWSON

The British Heteromera.

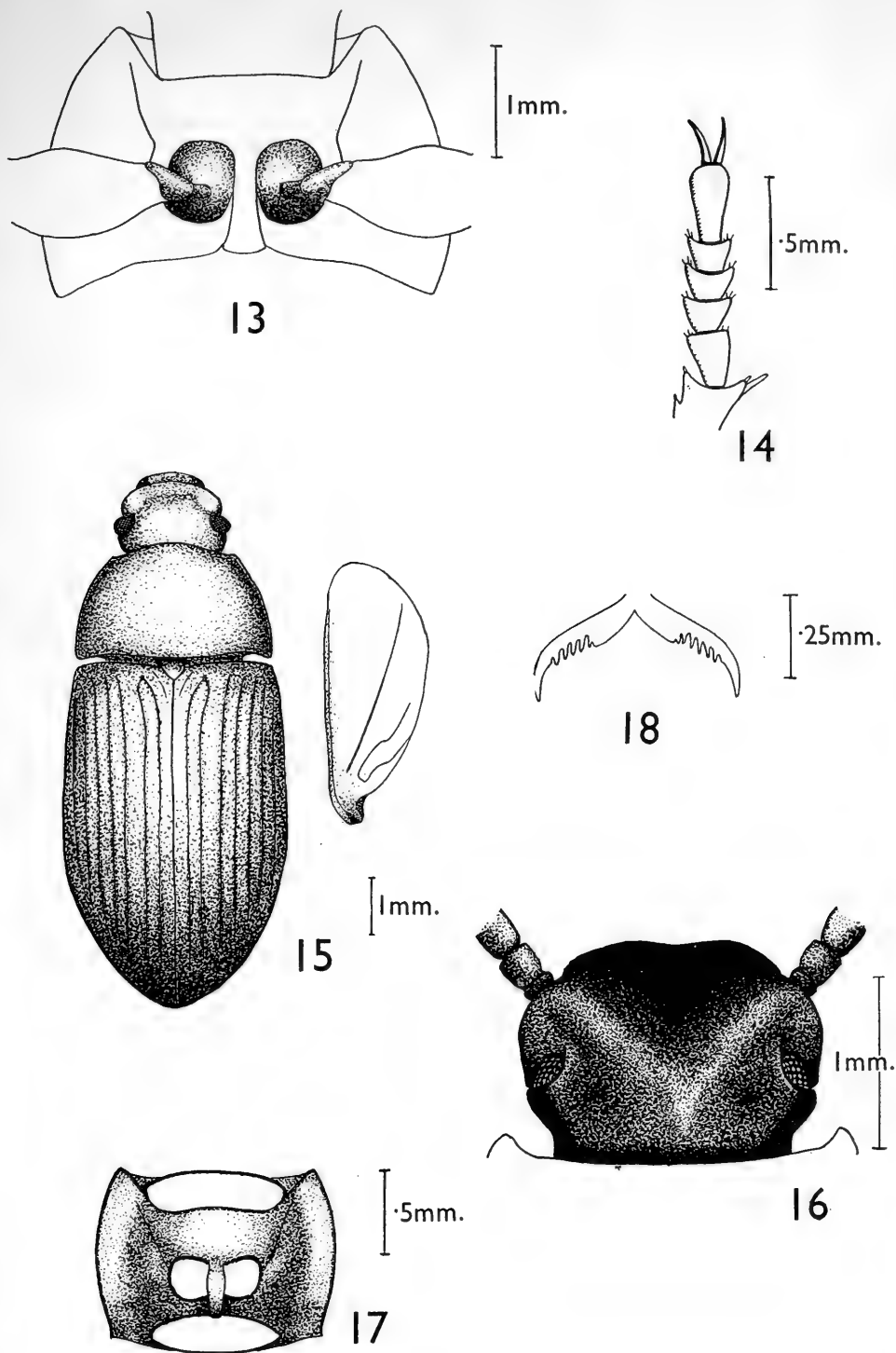
Figs. 2-4. 2, extruded aedeagus of *Byturus tomentosus* (Deg.); 3, aedeagus of *Schizotus pectinicornis* (L.); 4, met-endosternite of *Meryx* sp. B= basal piece; C=cap piece; L=parameres; M=median lobe; MS= median struts; P9=paraprocts (pleurites of 9th abdominal segments); S=sipha; S5, S6, S7=sternites of abdominal segments; SG=spiculum gastrale; SP7=spiracle of 7th abdominal segment; T7, T8, T9=tergites of abdominal segments; A=arms; F=ventral process; LA= lobes; ST=stem; T=tendon.



The British Heteromera.

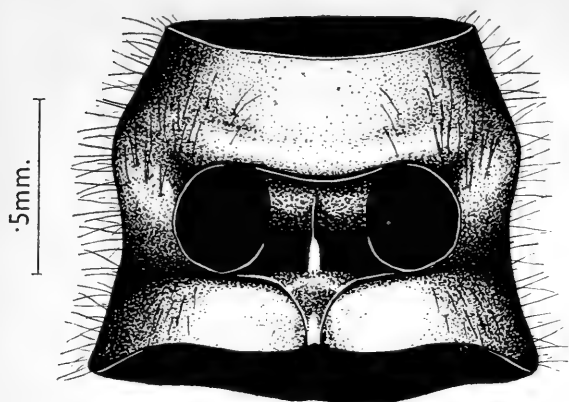
Figs. 5-12. Larvae of 5, *Cylindronotus laevioctostriatus* (Goeze); 6, *Pseudocistela ceramboides* (L.); 7, *Melandrya caraboides* (L.); 8, *Pyrochroa* sp.; 9, *Oedemera* sp.; 10, *Meloë* sp. (triungulin); 11, *Meloë* sp. (2nd stage); 12, *Meloë* sp. (3rd stage or pseudopupa).



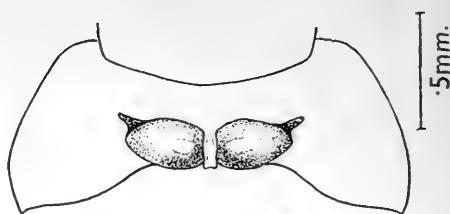


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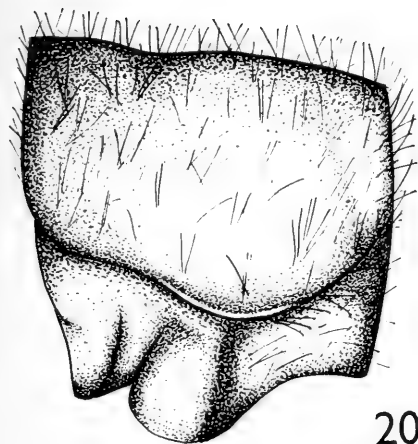
Figs. 13-18. 13, anterior coxae of *Cylindronotus laevioctostriatus* (Goeze); 14, anterior tarsus of *Phylan gibbus* (F.); 15, comparison of wing and body of *Cylindronotus laevioctostriatus* (Goeze); 16, head of *Phylan gibbus* (F.); 17, prothorax of *Gnathocerus cornutus* (F.), ventral aspect; 18, tarsal claws of *Prionychus ater* (F.).



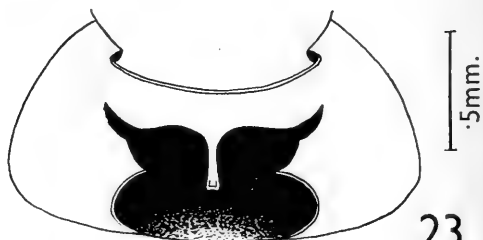
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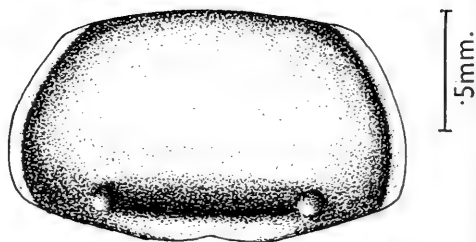
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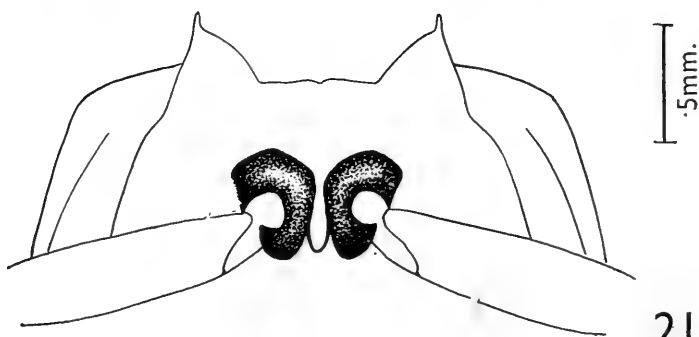
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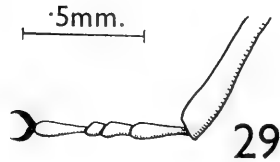
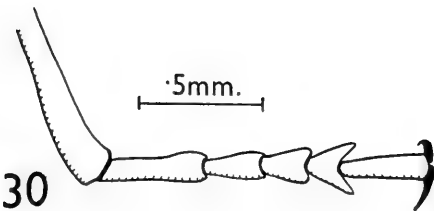
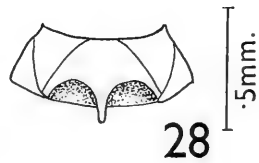
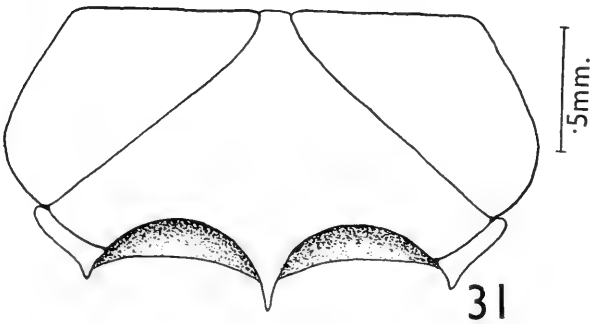
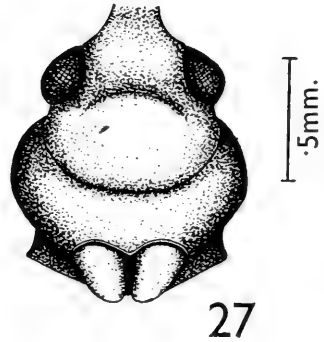
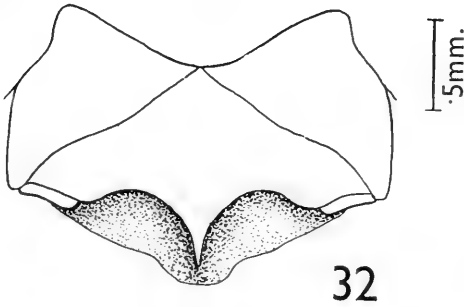
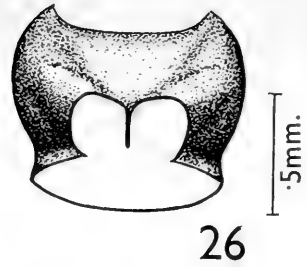
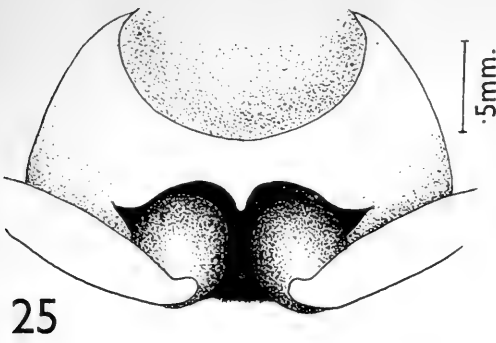
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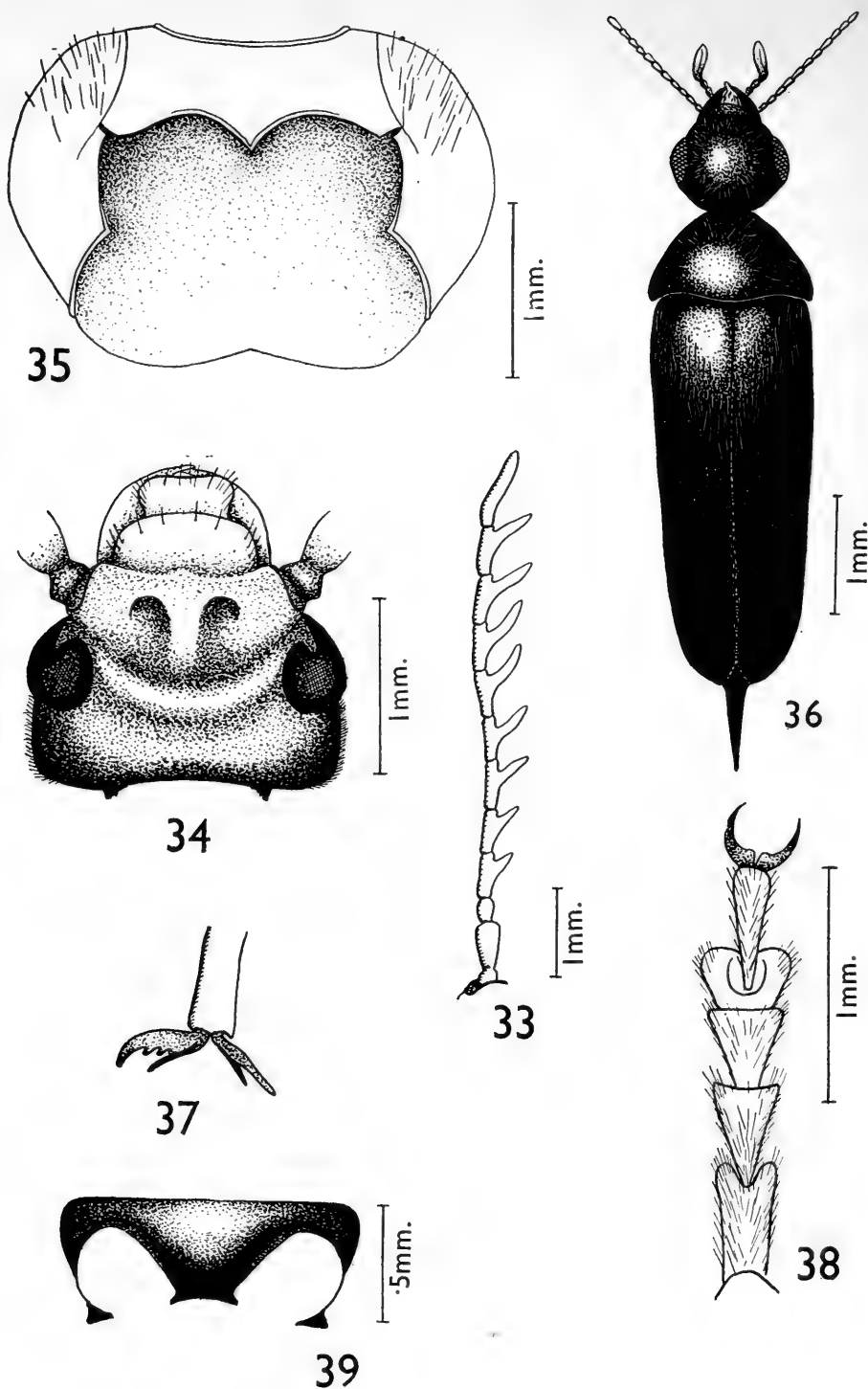
The British Heteromera.

Figs. 19-24. *Lagria hirta* (L.) 19, prothorax, ventral aspect; 20, prothorax, lateral aspect; 21, intermediate coxae; *Tetratoma fungorum* F. 22, prothorax, dorsal aspect; 23, prothorax, ventral aspect; 24, anterior coxae.



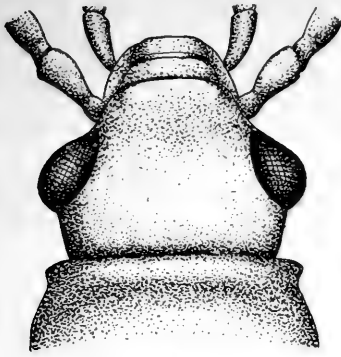
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Figs. 25-32. 25, *Melandrya caraboides* (L.), prothorax, ventral aspect; 26, *Rhinosimus ruficollis* (L.), prothorax, ventral aspect; 27, *Rhinosimus ruficollis* (L.), anterior coxae; 28, *Salpingus ater* (Gyll.), mesosternum; 29, *Salpingus ater* (Gyll.), tarsus; 30, *Mycterus umbellatarum* (F.), tarsus; 31, *Pytho depressus* (L.), mesosternum; 32, *Pyrochroa serraticornis* (Scop.), mesosternum.

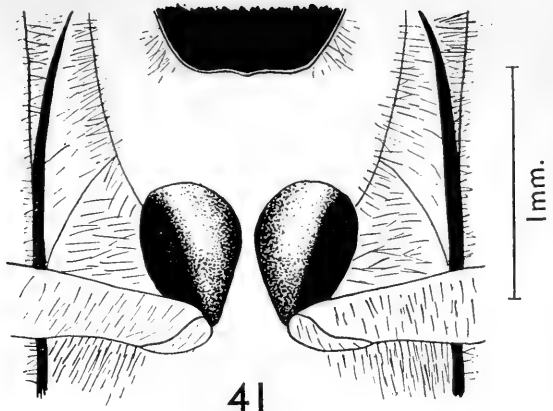


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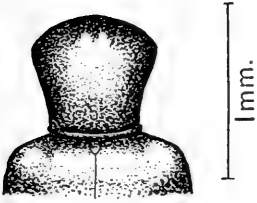
Figs. 33-39. *Pyrochroa serraticornis* (Scop.) 33, antennae; 34, head; 35, prothorax, ventral aspect; 36, *Mordellistena abdominalis* (F.) 37, *Tomoxia biguttata* (Gyll.), tarsal claws; 38, *Nacerdes melanura* (L.), anterior tarsi; 39, *Oedemera nobilis* (Scop.), prothorax, ventral aspect.



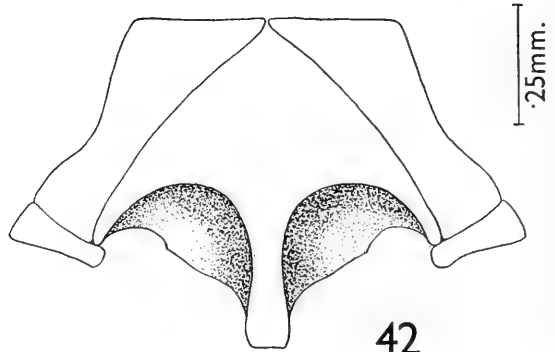
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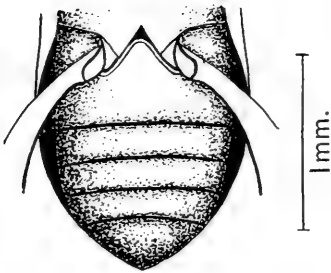
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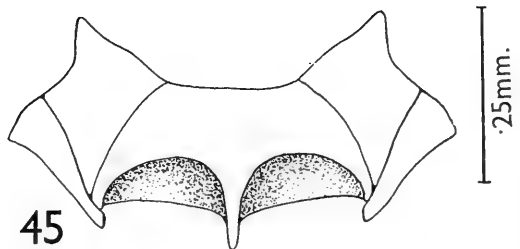
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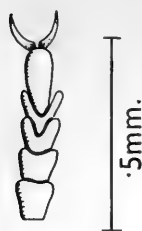
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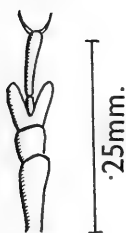
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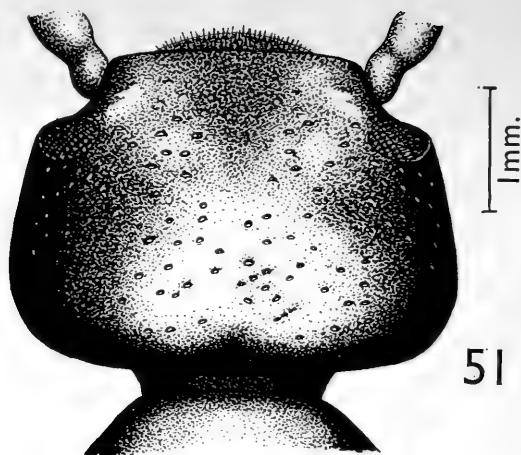
Figs. 40-45. 40, *Ischnomera caerulea* (L.), head; 41, *Oedemera nobilis* (Scop.), intermediate coxae; 42, *Anthicus floralis* (L.), mesosternum; 43, *Anthicus floralis* (L.), prothorax and base of elytra; 44, *Anthicus floralis* (L.), posterior coxae and abdomen; 45, *Aderus populneus* (Panz.), mesosternum.



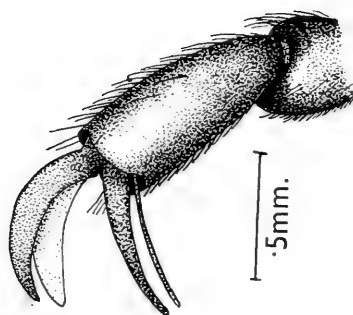
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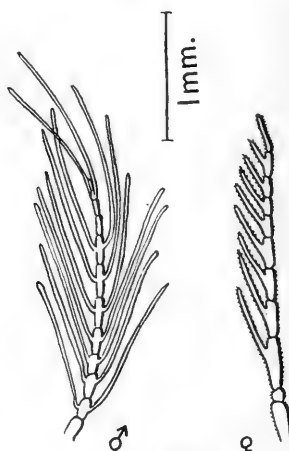
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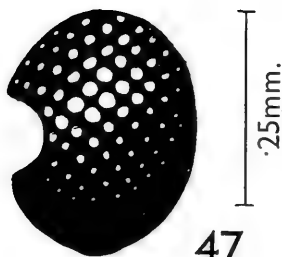
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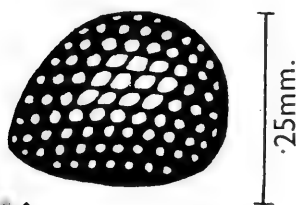
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The British Heteromera.

Figs. 46-52. 46, *Anthicus floralis* (L.), eye; 47, *Aderus populneus* (Panz.), eye; 48, *Anthicus floralis* (L.), tarsus; 49, *Aderus populneus* (Panz.), tarsus; 50, *Metoecus paradoxus* (L.), antennae; 51, *Meloë violaceus* Mars., head; 52, *Meloë violaceus* Mars., tarsal claws.

**AN ACCOUNT OF A RECENT VISIT TO EAST AFRICA  
TOGETHER WITH  
SOME OBSERVATIONS ON THE NATURAL HISTORY OF THAT  
REGION WITH SPECIAL REFERENCE TO THE LEPIDOPTERA.**

Resumé of a Lecture given before the Society on 13th May 1953.

By **BARON DE WORMS, M.A., Ph.D., F.R.E.S.**

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At the invitation of Mr. Elliott Pinhey, the entomologist at the Coryndon Museum, Nairobi, I decided to visit East Africa at the end of last year and for this purpose set out from London Airport in a "Hermes" airliner on a typical autumn day, 1st November 1952. By tea-time we were at Rome, by mid-night in Cairo. We flew on during the night down the Red Sea and were greeted in the morning by the Straits of Bab-el-Mandeb. We reached Aden at 11 a.m., local time, and spent a very sultry hour in the blazing sun. Here I had my first sample of oriental Lepidoptera. The windows of the air station were covered with *Hymenia recurvalis* F., the noted Pyrale pest. We flew on that afternoon over the wastes of Somaliland and southern Abyssinia, reaching Nairobi at tea time, a distance of some 4,500 miles from London in just over 24 hours.

I was greeted by Mr. Pinhey who had arranged a very good suite for me in the Norfolk Hotel, Nairobi, which was surrounded by jacaranda trees in full bloom, and which was to be my headquarters whence I subsequently made many long distance expeditions. One of my first visits in the capital was to the Coryndon Museum on the western outskirts where I was able to view the very fine collection of East African lepidoptera largely obtained and arranged by Mr. Pinhey.

Before going on to say something about my activities I think it may be of interest to describe the main features of the geography of this vast territory I visited which combines the three countries, Kenya, a Crown Colony, roughly 220,000 square miles in area, almost twice the size of the British Isles, Tanganyika, a mandated territory, 360,000 square miles in area, with Uganda, a Protectorate, almost 100,000 square miles. 80% of Kenya is virtually waterless, the main habitable region apart from the coastal belt being what has become known as the White Highlands, a large plateau between 5,000 to 7,000 ft. above sea level some 300 miles inland from the west coast. It lies north-west of Nairobi and is traversed by the great Rift Valley which runs from the Red Sea to Northern Rhodesia. It is some 70 miles wide and is bounded by an escarpment 2,000 ft. high. It is this region with its equable climate that has been developed so much by the White settlers and which is the scene to-day of so much disturbance. This part of the Rift Valley is bounded by the great Aberdare Range with Mt. Kenya rising to 17,000 ft. on the Equator just 100 miles north of Nairobi, like



the other great peaks an extinct volcano; Mt. Elgon, 14,500 ft. on the Uganda border and the mighty Kilimanjaro, whose great massif rises to 19,500 ft.; 150 miles to the south of Nairobi. The southern part of Tanganyika is a vast expanse of savannah with the famous Serengeti plains between Lake Tanganyika, 450 miles long, and the immense Lake Victoria of 26,000 square miles, approaching the size of Ireland, and the source of the Nile. To the east of this great Lake we have the chain of smaller lakes Kivu, Edward, George and Albert, with the imposing Ruwenzori Range between the last two. These huge mountains, with peaks rising to nearly 17,000 ft., the African Alps, were only discovered as recently as 1888 by H. M. Stanley, and it was two months before he realised they were there since they are for the most part covered in dense cloud.

I will now go on to describe my journeys round and from Nairobi chiefly in connection with the lepidoptera I saw and collected in the various regions I visited.

NAIROBI. First visit, 2nd to 12th November.

As soon as I arrived I made use of the mercury vapour bulb which I had brought out with me. I was fortunate enough in finding a firm which made a very handy lamp standard which took to pieces. The whole apparatus could be carried in a suit case with a small box for the transformer. I erected this outfit on the verandah of the annexe to the Norfolk Hotel with very satisfactory results. One of the first most striking features was the amazing number and variety of Pyralids. In every locality where I collected by night this family was present. Next was the remarkable number of species of the Hemithiinae (Emeralds). Each example one took seemed to belong to a different species, all superb shades of green. The Deltoids were another very prevalent family. The chief Agrotid at this period was *Agrotis spinifera* Hbn., while several examples were taken of a very pretty orange Footman with four spots on the forewings, which in the male were crossed by a dark band. This insect turned out to be as yet undescribed, only few examples appearing in the collections of the British Museum. Many species of Sterrhinae and a few *Eupithecias* were taken at the light. On 10th November I used the light outside the Coryndon Museum. The most notable visitor was *Auchinusa senex* B. Baker, a handsome silvery Noctuid of which only a few specimens had hitherto been taken in East Africa.

Owing to the political situation I was not able to penetrate far into the surrounding country. However, on 8th November, a Sunday, Mr. Pinhey drove me to Thika, 25 miles north on the road to Mt. Kenya. Here I had the first sample of tropical butterflies. In the afforested gorge below the falls on the river I had my first thrill of seeing those magnificent insects, the *Charaxes*. A grand green and white *C. can-diope* Godt. sailed across the river, while a purple and black *C. cithaeron* Fdr. settled on a branch high over our heads. All about the local gardens was flitting *Papilio nireus* L., black and green, while on the grassy slopes above the gorge we took several species of Pierid, mainly



*Above.* Mt. Meru (15,500 ft.), Northern Tanganyika, showing the crater on the eastern face.

*Below.* The Bismarck Hut at 9,900 ft. on Mt. Kilimanjaro, showing primeval forest in the background.



*Colotis* and the yellow *Terias* (*Eurema*). We also netted some interesting Dragonflies and Pyrales, while many species of *Acraea* were sailing about in the undergrowth.

During this stay in Nairobi Mr. Pinhey drove me one evening to the National Game reserve 5 miles from the city. Here we saw a fine herd of giraffe and large numbers of gnu, hartebeeste, zebra and several kinds of gazelle, chiefly Thompson's and Grant's. A jackal put in a late appearance, but no lions were seen unfortunately.

GILGIL. First visit, 12th to 14th November.

I set out early on 12th November by a small motor coach to cover the 75 miles to Gilgil, which lies in the Rift Valley to the north-west of Nairobi. We descended the great escarpment into the Valley, passing Lake Naivasha en route. We saw ostriches and secretary birds strutting in the fields, and all manner of birds of prey on the telegraph wires.

At Gilgil I was met by Major Peter Jackson, son of Capt. R. A. Jackson. I stayed with him and his family at his charming residence on the outskirts of the town. His verandah was alive with lepidoptera after dark, mainly the very complex species of *Leucania* which are very prevalent in the region. The first insect I took at dusk in his garden was *Heliothis peltigera* Schiff. The next morning he took me by jeep into the local hills at Kinongop where we had a grand couple of hours sampling the amazing variety of butterflies. Possibly the most interesting in this forest region at 7,000 ft. was *Colias electo* L., very like our *C. croceus* Fourc., which was remarkably active and produced many white females. The commonest Blues were *Lampides boeticus* L. and *Cacyreus lingens* Cramer, another tailed species with a chequered underside. We went up to just on 8,000 ft. where wheat was being cultivated. Here I took the high altitude Lycaenid *Harpencyreus aequatorialis* E. Sharpe together with two species of Geometer-like noctuids with yellowish forewings, *Antarchaea rhodopa* B. Baker and *A. curvifera* Hampson. Very few specimens of the latter are extant. On the way back we took two more attractive Lycaenids, *Cupido hippocrates* F. and *C. grammicus* G. Smith, which has a black-streaked underside, while on the lawn of Major Jackson's house was flying the minute Blue, *Antizera stellata* Trimen.

That evening I accompanied my hosts and their children into the Teleshira bush country dotted with the candelabra trees, huge euphorbias. Here we were lucky enough to see a large herd of eland at fairly close quarters together with many zebra, a few bushbuck and impala. We also visited the famous Lake Elementita where the whole horizon was pink with flamingoes, an unforgettable sight. A party of sacred ibis greeted us on the way home.

KITALE.

On 14th November I continued my journey by motor coach for another 180 miles to the north-west reaching Kitale in the dusk at 7 p.m. En route we climbed up the western escarpment of the Rift

Valley to Molo which claims the highest railway station in the Empire, just over 9,000 ft. Shortly afterwards we crossed the Equator and passed through Eldoret where there is quite a large Dutch population. At Kitale I was greeted by Major Heathcote with whom I stayed the next two days. His delightful residence faced directly on to Mt. Elgon some 30 miles away, a grand vista. The next day I accompanied him to a local river bed, bordered with bunches of clematis similar to our Traveller's Joy. Here many butterflies were on the move, including *Danaus chrysippus* L., *Eurema desjardini* Bdv., bright yellow, several species of *Acraea* and the brown Lycaenid *Cacyreus palaemon* Cramer. The Skipper family was much in evidence here and I took among others the following species—*Sarangesa lucidella* Mab., *Spialia dromus* Plotz, *S. diomus* Hoffr., *Metisella medea* Evans, *Borbo fallax* Galde and *Cyclopides formosus* Btlr. with a very pretty black and yellow underside. In the evening my host took me to the escarpment from where it was possible to see almost as far as Lake Rudolf, 150 miles to the north. The afternoon of the 17th we went over to see Capt. T. H. E. Jackson, who has a lovely house and large coffee estate on the foot of Mt. Elgon. He showed me his magnificent collection of African butterflies contained in over 500 drawers. In his fine garden were many remarkable exotic plants. While viewing these a huge female brown and white *Charaxes brutus* Cramer flitted over our heads. Later my host drove me the 40 miles into Eldoret. On the way we passed a heard of giraffe browsing unconcernedly by the road on their favourite thorn acacia. That night I caught the mail train to Uganda. In the morning we passed through the many cotton and banana plantations for which this region is famous, and about lunch time crossed the Nile at its source at Jinja and got a grand view of the Rippon Falls and the huge dam which is being built just below them.

**KAMPALA.** First visit, 18th to 24th November.

I reached the capital of Uganda that afternoon after a journey of some 300 miles. Here at an altitude of 3,000 ft. the climate is quite tropical and humid with thunderstorms almost daily. I stayed at the very comfortable and spacious Imperial Hotel for the first three nights and then moved on to stay with our member, Mr. D. Sevastopulo and his wife. On the 20th, I travelled to Entebbe, 21 miles south on the edge of the vast Lake Victoria. En route I did some collecting in a wooded glade, taking several good species including the large orange Lycaenid, *Paraclema clarensis* Neave, peculiar to this region, also another of this family, with long white waving tails, *Hypolycaena hatita* Hew., as well as the pretty white *Oberonia punctatus* Dew. There were also flying several Satyrids, *Ypthima albida* Butler, with pale grey centre to their wings together with the abundant *Y. asterope* Klg., while many *Neptis* were gliding about, mainly *N. agatha* Stoll. At Entebbe I got my first view of the great Lake with the line of the Equator only three miles off shore, and some gloriously coloured kingfishers flitting along its edge.

Back in Kampala I rigged up my m.v. lamp in Mr. Sevastopulo's garden with very good results almost nightly. Again the Pyralids were much to the fore.

Many good species of Lithosiids appeared as well as a species of the Lasiocampidae which has proved to be new. A feature one night was a huge flight of a great green grasshopper which is much relished by the natives. Many species of *Plusia* were much in evidence, including *P. transfixa* Wkr. and *P. limbirena* Guén. During my stay in the very picturesque capital I made a daytime journey to Kawenga to visit the well-known Entomological Station where much important work is being carried out.

#### TRIP ROUND WESTERN UGANDA. 24th to 30th November.

Early on the morning of the 24th I set out in a rather primitive native bus for the 200 mile journey to Fort Portal in the extreme west of the country. For most of the time I was the only European on board. The route lay through quite a large area of forest interspersed with papyrus swamps emanating from Lake Victoria. Blue water-lilies were plentiful in these swamps. They are said to be the lotus of the Bible. We reached Fort Portal at dusk and the next morning I got my first view of the foothills of the famous Ruwenzori Range only twenty miles away. But as usual the great peaks were covered in cloud with intermittent deluges. I set to work collecting in the vicinity of the township. The chief Blue was *Harpendyreus wollastoni* B. Baker peculiar to this region. Many day-flying noctuids were on the wing, mainly the conspicuous *Parachalciope deltifera* Fdr. and the common *Mocis undata* F. During the afternoon I got quite close to a pair of Crowned Cranes feeding unconcernedly on the local golf course. Some glorious sunbirds were to be seen too.

I continued my journey southward next day under somewhat precarious conditions as the rains had washed away some of the only road south, quite a common occurrence. The native bus skirted the whole of the Ruwenzori range for eighty miles finally emerging in the great open plateau almost dead on the Equator which was marked at the side of the road. Soon afterwards I had a great thrill in seeing some elephants at close quarters with some buffalo not far away. We reached the Kazenga Channel joining Lakes George and Edward about noon. I crossed it in rather a perilous looking ferry and was told another bus was due to take us on to Mbarara. Two hours' wait in the broiling sun and no bus appeared. I watched some pelicans and hippos in the distance. Finally I was rescued by a South African engineer who was building the foundations for a bridge over the Channel. He took me up to the hotel at Kichwambe on a high escarpment overlooking the plain. I was well rewarded as in the late afternoon the whole area below was alive with game. I saw a herd of quite a hundred elephant emerge from the bush and amble slowly through the tall elephant grass. There were buck galore of many kinds and a few buffalo, an unforgettable sight. Next morning yet another reward. The skies had cleared

and there in front was the whole of the high peaks of Ruwenzori in sombre majesty only 50 miles away with Mt. Stanley rising in the middle to nearly 17,000 ft., covered in snow and surrounded by glaciers. Apparently these peaks are seldom seen in such clearness. Some travelers from the Belgian Congo motored me 75 miles to Mbarara and en route we passed the scheduled bus upside down on a bank. We also went through part of the Kalenzu Forest, a grand collecting ground, where we saw a party of the Colobus monkeys, a most fascinating sight. At Mbarara I did some profitable collecting, especially in the evening when the verandah of the hotel was alive with lepidoptera, especially many species of *Leucania*.

Next day, the 28th, a Mr. Maltby gave me a lift 100 miles to the south west to Kabale in the Kigezi region. The latter part of the journey reminded me of the Cotswolds with undulating hills and grassy slopes interspersed with plains covered with innumerable Termite hills. We saw large herds of the famous Ankole cattle with their huge expanse of horns. We stayed at the charming White Horse Inn perched on a high eminence. During my two day sojourn in these superb surroundings, day collecting was quite productive though I did not see many new species. *Ypthima albida* Btlr. was again the commonest Satyrid. Several interesting Lymantriids appeared at night and *Xanthorhoe procne* Fawcett and other carpets were abounding in Cypress and *Semiothisa fulvimargo* Warren among Wattle. The District Commissioner, Mr. D. Burgess, himself a keen collector took me to see his recent acquisitions mainly in the impenetrable Forest of Kigezi which harbours gorillas, only 30 miles from his headquarters.

On the 30th another friend drove me back the whole 300 miles to Kampala after what had been a most enchanting tour and in many ways the high light of my whole trip.

KAMPALA. Second visit, 30th November to 3rd December.

Back in the capital I once more stayed with Mr. Sevastopulo who had been doing well with my m.v. light during my absence. On the afternoon of 2nd December I visited the Zika Forest near Entebbe and had quite a harvest of butterflies which were in great plenty. In a swampy glade of the forest I took some fine Papilios, notably *P. bromius* Dbl., *P. polycenes* Cramer and the huge and swift *P. lormieri* Dist. looking like an outsize *P. machaon* L. *Hypolimnas dubia* Pall. was flopping about in the dense undergrowth of this truly tropical forest, while in the open I took *Amauris hyalites* Butler and the rare *Mesoxantha ethosea* Drury, and the large orange and black *Bematistes poggei* Dew. The pretty *Precis sophia* F. and *P. octavia* Cr. were abundant, similar in habits to our Vanessids. Skippers and Blues were dancing everywhere, notably *Gegenes niso* Plötz and *Eretis lugens* Rog. Bird life was very rich, with several species of Hornbills and a large party of the great grey Touracou.

I left Kampala on the morning of the 3rd December and embarked upon the Lake Victoria steamer at Port Bell. Here I had the pleasant



coincidence of meeting Mr Ross of the Botany Dept. of the British Museum (Natural History) who had been taking part in the recent expedition to Ruwenzori. We had a most delightful trip of some 170 miles across the Kavirondo gulf. At dusk an amazing phenomenon took place. May flies by the thousand came aboard and died almost immediately (vide 1953, *Ent. mon. Mag.* **89**: 168). We reached Kisumu at the eastern end of the Gulf early on the 4th and I spent the afternoon watching egrets, buff-backed herons, sacred ibis, black winged stilts and lily trotters on the edge of the Lake. The next morning saw me again en route through the large tea plantations of the Kericho. My next halt back in Kenya was at Nakuru, a very well appointed town.

**GILGIL.** Second visit, 5th to 8th December.

I again stayed with Major and Mrs. Jackson who were about to depart for England after four years in Kenya. For collecting I concentrated on the local open country. Pierids and Skippers were the chief quarry. My captures included *Colotis evippe* L. and *C. vesta* Reiche looking like large Orange tips, *Anaphaeis severina* Cramer and *A. gidica* Godt., the former sometimes in large assemblages on damp ground. Also the minute skipper *Spialia zebra* Butler. There were also many of the bright yellow *Eurema brigitta* Cramer.

**NAIROBI.** Second visit, 8th to 13th December.

On this occasion I stayed with Mr. Pinhey and his wife at their flat next to the Coryndon Museum. Collecting was chiefly confined to the m.v. light, Mr. Pinhey rigging up on one occasion a 400 watt light. Moths were fairly numerous, *Auchinusa senex* B. Baker reappeared as well as the orange noctuid *Rhanidophora cinctigutta* Wkr. with many Emeralds and Sterrhinae.

During my stay I paid a visit to the fine new Agricultural Research Station at Muguga.

**VISIT TO TANGANYIKA, ARUSHA.** 13th to 18th December.

Early on 13th December I set out in a very comfortable motor coach to the south on what was to prove another most interesting safari. Immediately south of Nairobi we crossed the Athi plains, home of the Masai tribe, a veritable paradise for big game. Everywhere were to be seen large herds of buck and gazelle with zebra and hartebeeste at intervals. Many ostrich and an occasional huge Kori bustard trotted off from the dusty road. At one point near the Tanganyika border after a 100-mile journey we had to wait for a bull giraffe to amble off the roadway. Trees with weaver birds' nests hanging from them were everywhere. Just before the border we lunched at a charming and very picturesque hotel at Namanga and afterwards we pushed on another 80 miles into the volcanic region reaching Arusha, a sort of oasis, by evening. Here were large coffee plantations and a good deal of seisal. I diffidently enquired at the very well appointed Safari House Hotel if I could plug in my m.v. lamp and was pleasantly surprised to



find that the manager, a Mr. Allen, used to collect moths in the New Forest. So I had a very welcome reception. I duly set up my light in my bedroom for five nights and very profitable it was. On the first I was visited by *Hippotion celerio* L. and a host of Noctuids, among which were the prevalent species *Laphygma exempta* Wkr., *Prodenia litura* F., *Miselia inferior* Guen. and *Maurilia arcuata* Wkr. I took two Cossid species which appear to be new. Pyralids were again in numbers.

On my first morning I had a grand view of Mt. Meru towering 15,000 ft. over the town. Butterfly life was very rich. By a small stream at the back of the main road the slopes were alive with *Precis clelia* Cr. and *P. ceryne* Bdv., known respectively as the Blue and the Yellow Pansy, while nearby was flying *Papilio demodocus* Esp. in plenty together with an occasional white male *P. dardanus* Brown. The orange and black *Byblia ilythia* Drury was sailing along a gentle slope, while in a shaded part near the local river I took the Satyrid *Mycalesis safitza* Hew. and several species of *Acraea*, including the scarlet *Acraea johnstoni* Godm. On the 16th Mr. Allen motored me to the estate of a planter on the east side of Mt. Meru when we got a grand view of the huge crater. En route we had a wonderful vista of the whole Massif of Mt. Kilimanjaro, 70 miles away and the biggest single mountain in the world. The glorious garden of our host was full of all manner of wild life. We found fresh tracks of a rhino; elephants had been seen the previous day quite close. We watched a colobus monkey at close quarters, while the lovely blue and black *Papilio brontes* Godm. was swooping around, just avoiding capture: altogether a most delightful setting.

#### MOSHI, MARANGU AND MT. KILIMANJARO. 18th to 24th December.

On the morning of the 18th, I travelled the 70 miles to Moshi across a very sun-baked plain full of zebra with a few giraffe. I had hoped to push on to Marangu at the foot of Kilimanjaro, but the repairs to the local and only bridge on the new main road held me up for two days. I was well rewarded with some splendid photos. of the great peak nearly 40 miles distant. However, on the 20th, a private car took me to the delightful hotel at Marangu, and here the many coloured bougainvilleas were alive with *Papilio demodocus* Esp. The next morning I took a walk to the waterfall at the head of the ravine behind the hotel, taking en route *Papilio phorcas* Cramer and *Neptis melicerta* Drury. On the grassy slopes was flying the pretty orange geometer *Rhodometra lucidaria* Swinhoe, while by a stream were companies of a *Catopsilia*. In the evening I stood sentinel over a hedge of blue plumbago which just at dusk was visited by the large Skipper *Artitropa erinnys* Trimen f. *ehlersi* Karsh., orange and white, a most fascinating insect as it digs its proboscis deep into the flowers. These were followed by a flight of small green sphinges which were extremely agile and difficult to net. The garden of the hotel was alive with small Lycaenids, chiefly *Zizeeria lysimon* Hbm. and *Zizula gaika* Trimen.



*Above.* Lake Elmenteita, one of the Kenya soda lakes, showing rows of flamingos in the background.

*Below.* Mt. Kilimanjaro (19,320 ft.) from Moshi, Northern Tanganyika. View of the western face. The peak is about 40 miles distant.



On the morning of 22nd December I set out about 7 a.m. with a young native guide to ascend to the first hut on the great mountain. Our route lay first among cypress woods, then several miles through banana plantations till finally we came to a spot with a notice that it was virgin forest ahead and a game reserve. This was a most enchanting area with a narrow footpath ascending among a dense canopy of trees. Every now and then we came on a small glade and in these haunts many butterflies would be disporting themselves, especially *Papilio phorcas* Cramer and I took a single *Antanartia schaenia* Trimen looking rather like a Red Admiral with tails. Several species of *Neptis* were gliding about. Suddenly at about 8000 ft. the forest area gave way to long grass with a grand view of the snow-clad summit. Here in the bracken were flitting *Argynnis hanningtoni* Elwes settling on a species of thistle and behaving exactly like one of our small fritillaries. I also noticed a creeping violet in profusion in this area. Shortly afterwards we dived into the zone of the giant heaths mostly about 40 ft. high and entwined with lichens, a most eerie sight. As we ascended further more grassy areas appeared till at about midday the Bismarck Hut loomed ahead at just on 10,000 ft. and 11 miles in walking distance. I set out to study the fauna and flora of this fascinating area. The commonest butterfly was the Lycaenid *Harpenderus aequatorialis* E. Sharpe always found at a high altitude. Among the variety of plants and flowering shrubs were species of *Hypericum*, *Senecio* and Red Hot poker. Our descent by the same route took us till dusk. We collected all the way back, mainly geometers. In one forest stretch in the late afternoon we came across a flight of a superb species *Hydrelia sjoestedti* Auriv., a Carpet dove-grey with white bars and found apparently only round Kilimanjaro. So ended a very energetic and interesting day. I spent another day at Marangu and then returned to Moshi and on from there by motor coach via Arusha to Nairobi, arriving on the evening of Christmas Eve.

NAIROBI. Third visit, 24th December to 2nd January 1953.

I spent a very pleasant Christmas at the Norfolk Hotel, quite in English style with plenty of gaiety, though it seemed out of season in the summery weather. During my ten days sojourn proved the most productive for my m.v. light on the verandah of the annexe to the hotel. I had many "old friends" to visit me including *Acherontia atropos* L., *Agrotis segetum* Schiff., *A. ipsilon* Hufn. (*ypsilon* Rott.), *Laphygma exigua* Hb. and *Rhodometra sacraria* L. whose near relative, *R. intervenata* Warren also appeared. One night there was a run of *Rhanidophora cinctigutta* Wkr., orange with white spots. Almost the last insect I took in this spot was a remarkable geometer, quite small, almost transparent, slightly spotted and with heavily pectinated antennae. It turned out to be *Blaboplutodes missilorum* Prout, of which the type from the Congo is the only other example known.

On the last day of the year I accompanied Mr. Williams of the Coryndon Museum for an outing to the Athi Plains, where he collected

birds while I used my net. Many butterflies of interest were seen, including *Mylothris poppaea* Cramer, *Acraea cecilia* F. and *Pardopsis punctatissima* Bdv.

During my stay Mr. Pinhey took me to see Dr. Van Someren on the outskirts of the city. I spent a morning viewing his magnificent collection of African lepidoptera, one of the most comprehensive ever made. I travelled on 2nd January by air to Entebbe and once more back to Kampala staying again at the Imperial Hotel.

KAMPALA. Third visit, 2nd to 5th January.

The chief feature of this final and brief stay in Uganda was another visit to the Zika Forest on the 4th with Mr. Sevastopulo. Once more butterflies were in fair plenty though the sun did not favour us for long. *Papilio lormieri* Dist. was again much in evidence together with *Hypolimnas dubia* Pall. A very entertaining species which gave us a good chase was *Euphaedra uganda* Auriv., a huge insect which flitted about in the densest parts of the forest, always just one stroke ahead of your net. I also took a very local Dragonfly with a black bar across the wings.

On the evening of the following day I embarked at Entebbe on a "Comet" for the homeward journey. As we rose quickly in the dusking the whole valley of the Nile from Lake Victoria to Lake Edward was plainly visible. By midnight we were in Khartoum, and at 3 a.m. in Beirut. We reached Rome at dawn and were providentially delayed there for a few hours so that we did the last leg in daylight, thus passing over the Alps in their winter mantle. We touched down at London Airport by mid-day on the 6th. A pall of snow was there to greet us. There was a difference of 50 degrees F. in temperature between Entebbe and London.

Thus ended a most delightful tour full of interest, a real eye-opener, which from the Natural History point of view alone I can most heartily recommend to anyone with the real keenness to embark on such an enterprise.

EXPERIMENTS WITH *ABRAXAS GROSSULARIATA* L.

By DEREK A. ASHWELL.

Read 9th September 1953.

One of the difficulties of doing experiments in genetics is that sometimes it is necessary to decide exactly and speedily to which of the expected forms a given individual belongs. This may sound rather like making a mountain out of a molehill, for it may be quite easy, when all the individuals are dead and set out side by side in a drawer of the cabinet, to sort out which are which form. But the major interest of genetic breeding is in the future generations, and in practice one has to decide quickly the form and sex of an individual specimen while it is alive and often too frisky to allow a prolonged and intensive study of all its parts. Thus, for the amateur, breeding chiefly for the fun of the game, it is wise to start with forms which can easily and quickly be distinguished from one another. Variations in the colour and pattern of the wings are an obvious first choice, and here variations in a pattern which is a "contrasty" picture in the photographic sense, such as the black and white markings of *Abraxas grossulariata*, will be much easier to spot than, say, variations in the photographically "soft" grey pattern of the forewings of *Catocala fraxini* L.

In my case availability of the varieties also played a part, for when I started genetic studies there were available two varieties of a species which were both very different from the type form and also very different from each other—the varieties *varleyata* Porritt and *dohrnii* Koenig of *Abraxas grossulariata*. I was also interested in this species because some 25 years earlier my father had captured a specimen in which the wings on one side were of a very distinctly different colour pattern from those on the other. A further point in favour of this species was that the two available varieties represented two different mechanisms of inheritance, and I could thus study both at the same time, a labour-saving device which appealed to me.

In the variety *varleyata* the area of black on the wings is greatly extended, but in *dohrnii* this area is greatly reduced and the ground colour is changed from white to deep cream; my problem was to find out just what would a specimen look like if it had the necessary genes to make it develop both as *varleyata* and as *dohrnii*. Such an individual would presumably have a deep cream ground colour, but how much black pigment would there be on the wings and in what areas would it lie? I was told that such forms were named *exquisita* Raynor and *nigrocetacea* Raynor but none of my acquaintances could tell me just what they looked like.

[NOTE. *Exquisita* and *nigrocetacea* are both Raynor names, and were described in the *Ent. Rec.* by him; the former in 1918/19 (*Ent. Rec.*, xxx: 189, and xxxi [he says xxi]: 205) and the latter in 1923 (*Ent. Rec.*, xxxv, No. 9: 141). Of the latter he says:—"Very similar to *exquisita*, but having the white areas larger and more transparent", etc., etc. He evidently regarded them as different forms, and from his descriptions it appears he intended the names to apply to insects with a white ground colour not a cream one. He listed them both under *varleyata* aberrations.—C.N.H.]

Already I had acquired a theoretical knowledge of the mechanisms of the autosomal recessive inheritance of *varleyata* and the sex-linked recessive inheritance of *dohrnii*, and as I wished to produce my combination of the *varleyata* and *dohrnii* characters as speedily as possible I chose as my starting point the mating of a male of var. *dohrnii* with a female of var. *varleyata*. Such a mating had been made in the summer of 1945 by Mr. L. H. Newman and should have produced the combined form in two generations only. Mr. Newman told me that while he could not predict exactly what forms he would have available for mating in 1946 he expected he would have some males of *dohrnii* and females of *varleyata* emerge and would endeavour to make such a mating for me.

However, when the time came, in June 1946, Mr. Newman found that all his males were typical, and all his females were *dohrnii*, so he made a mating of these and I took over the brood. The female deposited many ova, probably over 300, but only 267 produced larvae in due course, and these were placed in a sleeve on a black currant bush in my garden.

Now for a moment let us look at the genetics of this brood and predict what we shall rear. Let us first consider the variety *varleyata*, which we know is inherited as an autosomal recessive, that is to say, the gene which, in joint action with all the other genes in the individual, produces the *varleyata* variety, and the gene which in a typical insect takes the place of the *varleyata* gene, are carried on a pair of chromosomes other than the sex-chromosomes, and that the *varleyata* gene has a weaker action than its alternative "normal" gene.

The male grandparent of the brood was not var. *varleyata*, and also was not related to any brood producing the *varleyata* variety, so this parent carried, on both the particular chromosomes concerned, the stronger "normal" alternative gene. The female grandparent was var. *varleyata* and so carried the weaker *varleyata* gene on both chromosomes. As each parent contributes only one of its pair of genes to each offspring the next generation will consist solely of individuals having one strong "normal" gene received from their father and one weak *varleyata* gene received from their mother; the effect shown in the colour pattern in this generation will be that of the stronger dominant "normal" gene, and all the individuals will be of the normal spotted pattern; we have apparently "lost" the *varleyata* variety.

But the mating which I took over in 1946 was a pairing of brother and sister from amongst these normal individuals, and both brother and sister carried on one chromosome the recessive *varleyata* gene, and on the other chromosome the dominant "normal" gene, and both transmit to their progeny either one or the other of these genes. Thus half the progeny will receive the *varleyata* gene and half the "normal" gene from their father, and similarly half will receive a *varleyata* gene and half a "normal" gene from their mother. One quarter of the brood will have received a "normal" gene from each parent, one quarter a "normal" gene from the father and a *varleyata* gene from the mother,



one quarter a *varleyata* gene from the father and a "normal" gene from the mother, and the final quarter will have received a *varleyata* gene from each parent. The first three portions of the brood will thus be normal in appearance and the remaining quarter will be var. *varleyata*. By inbreeding for one generation we have recovered the *varleyata* variety in a quarter of our brood.

Now let us consider the *dohrnii* variety, which we know is inherited as a sex-linked recessive; that is to say the gene which, in combination with all the other genes in the individual, produces the *dohrnii* variety, is recessive in action and is carried on that particular chromosome which also carries genes which are responsible for determining the sex of the individual. This is known as the X chromosome, and in the lepidoptera the male has two X chromosomes, while the female has only one, but the latter also has a chromosome, called the Y chromosome, which does not appear to have a direct influence on sex-determination, though its absence does have a profound effect on the sex of some individuals in future generations.

The male grandparent of our brood of larvae was var. *dohrnii*, that is to say both of its X chromosomes carried the recessive *dohrnii* gene. The female grandparent of the brood was not var. *dohrnii*, so that its one X chromosome carried the dominant alternative "normal" gene, and its Y chromosome of course carried neither. The male transmitted to all its progeny the recessive *dohrnii* gene, while the female transmitted either an X chromosome bearing the dominant "normal" gene, or a functionless Y chromosome. Thus some of the progeny received an X chromosome carrying *dohrnii* (from father) and an X chromosome carrying the dominant "normal" gene (from mother) and these, having two X chromosomes develop into males, and as the "normal" gene dominates the *dohrnii* gene are normal in appearance. The rest of the progeny receive an X chromosome carrying the *dohrnii* gene (from father) and the Y chromosome (from mother); these, having only one X chromosome, become females, and as the action of the weak *dohrnii* gene is not inhibited by its stronger "normal" alternative, the *dohrnii* gene is able to exert its effect and the females show the colour pattern of the variety *dohrnii*.

Thus in the first bred generation we have not lost our variety, though it has been transferred to the other sex, and we have the added advantage that a cursory glance from a distance is sufficient to indicate the sex of any individual imago.

The mating which I took over in 1946 was a brother-sister pairing of individuals from this brood. The male parent will hand on either an X chromosome bearing the recessive *dohrnii* gene or an X chromosome bearing the dominant "normal" gene; the female parent will hand on either an X chromosome bearing the recessive *dohrnii* gene, or a Y chromosome. Thus four types of progeny will be produced (1) those receiving two X chromosomes, both bearing the *dohrnii* gene—these will produce males of var. *dohrnii*; (2) those receiving two X chromosomes, one bearing the recessive *dohrnii* gene and the other the dominant



Key to all diagrams :

V="normal" gene, dominant over varleyata gene.

v=varleyata gene.

D="normal" gene dominant over  
dohrnii gene.

d=dohrnii gene.

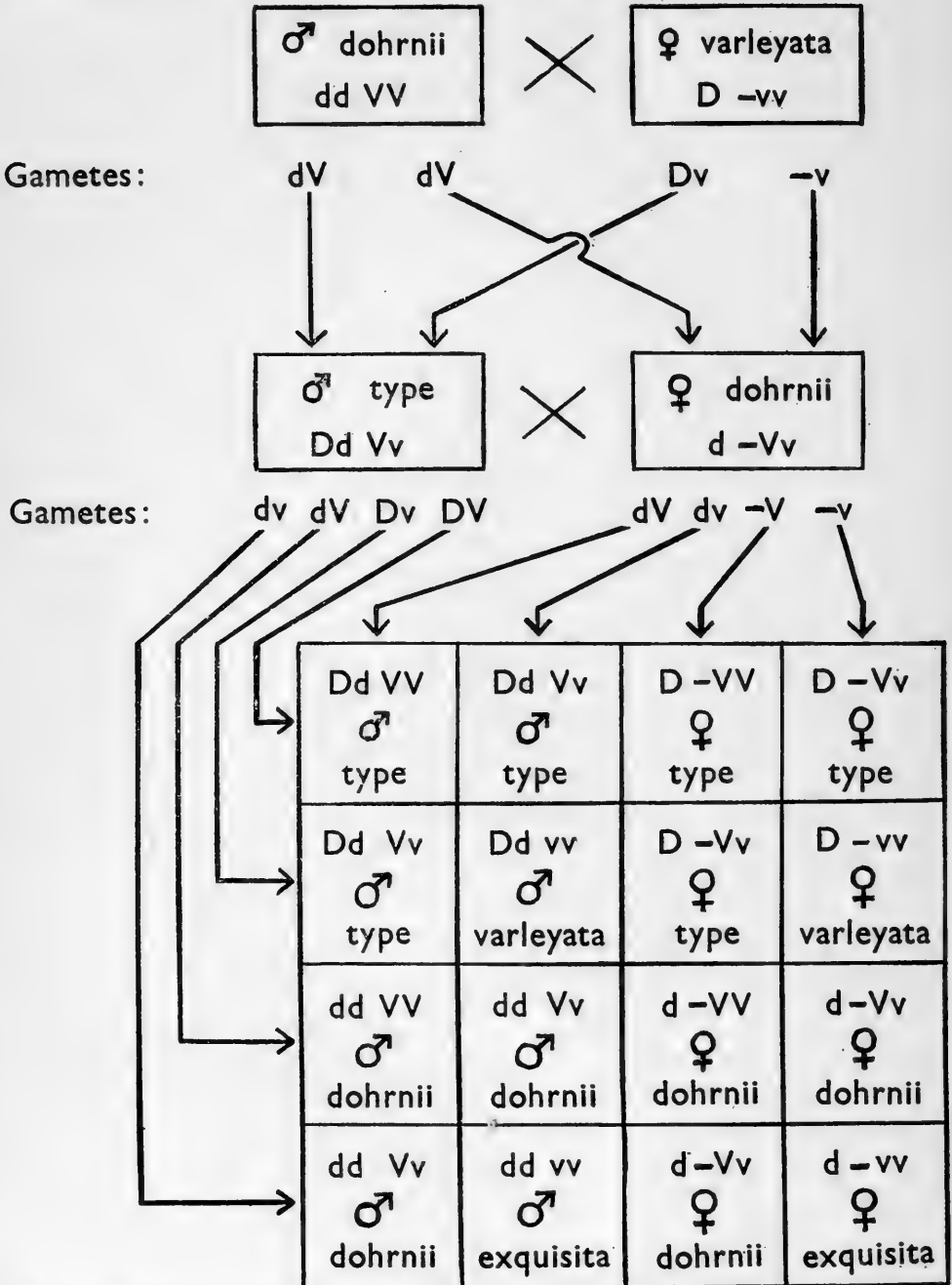
} carried on  
sex  
chromosomes

Fig 1. Production of exquisita by crossing and inbreeding of dohrnii ♂ with varleyata ♀

"normal" gene—these will produce "normal" males; (3) those receiving an X chromosome bearing the *dohrnii* gene and a Y chromosome—these will produce *dohrnii* females; and (4) those receiving an X chromosome bearing the dominant "normal" gene, and a Y chromosome—these will be "normal" females.

As by pure chance all four combinations are equally likely to occur, approximately half the males and half the females will be var. *dohrnii*, and the rest "normal" in colour pattern.

Let us now consider the two varieties simultaneously. The original 1945 mating was of male var. *dohrnii* with female var. *varleyata*. In the first bred generation the *varleyata* variety will not show in any of the brood, and the *dohrnii* variety will show only in all the females—we shall thus get a brood in which all the males appear "normal" and all the females are var. *dohrnii*. By inbreeding these we shall get a brood in which half the males will be var. *dohrnii*, and half not; also a quarter of the males will be var. *varleyata* and three-quarters not; and the same proportions will apply to the females.

As the genes causing the two varieties are carried on different pairs of chromosomes we shall get random assortment of the varieties, and our brood should segregate into (see figure):—males three-eighths var. *dohrnii* and not var. *varleyata* (*dohrnii* males); three-eighths not var. *dohrnii* and not var. *varleyata* (normal males); one-eighth var. *varleyata* but not var. *dohrnii* (*varleyata* males); and one-eighth var. *varleyata* and var. *dohrnii*; and females of these forms will occur in the same proportions. The last-mentioned section, the combination of the two varieties, will be a new form to appear in our brood. The Rev. Raynor called it *exquisita*, and what is probably a modification of it, *nigro-cretacea*. My personal preference for a name for it would be *lacticolor-varleyata*, but the nomenclature experts would probably not approve of this.

Now let us leave theory and see what actually happened. Of the 267 larvae which hatched in June 1946 and were sleeved on a Black Currant bush 15 developed much more quickly than the rest, and so in September were brought indoors in the warm and fed on the tender young shoots of *Euonymus japonicus*. The remaining larva entered hibernation in October.

Between 26th October and 9th December, the 15 precocious larvae produced 13 imagines, two larvae having died in pupation. These 13 imagines comprised:—2 normal males, 3 *dohrnii* males, 1 *exquisita* male, 5 normal females, and 2 *dohrnii* females, which result is in reasonable accord with our expectations for such small numbers.

But now follows a sorry tale. It might almost be likened to the tale of "The Ten Little Nigger Boys". 252 larvae entered hibernation in a cage in my greenhouse, but my hibernating arrangements were evidently unsuitable for this species, for in March 1947 only 75 survived. In a long spell of wintry weather almost all the young and tender shoots

of *Euonymus* had been killed by the frosts, and Black Currant, Sloe and other plums were late in making leaf. A sudden mild spell brought the larvae out of hibernation before the foodplants were ready, and great difficulty was found in providing sufficient food for several weeks, until some Gooseberry bushes broke into leaf. Of the 75 larvae only 53 pupated, and only 48 imagines emerged, all between the 3rd and 16th of June. These 48 imagines comprised:—22 male and 19 female "normals", 3 male and 3 female var. *dohrnii*, and 1 male var. *varleyata*, which result definitely does not agree with the expected ratio of 3:3:1:1.

252 larvae should have produced over 90 normals, over 90 var. *dohrnii*, about 30 var. *varleyata*, and about 30 var. *exquisita*; so we can assume that the adverse rearing conditions produced a survival rate, for the "normals" of 43%, for the var. *dohrnii* of 6%, and for var. *varleyata* of 3%. The var. *dohrnii* had a survival rate only one-seventh that of the "normals", and the var. *varleyata* only one-fourteenth that of the "normals". The var. *exquisita* is presumably even less likely to survive.

These results suggest a possible explanation why these varieties, in the course of evolution, have become recessives. In a free-mating population composed of two (or more) forms the heterozygotes will be much more plentiful than either homozygous class. As the population of this species is not subject to great fluctuations in numbers the elimination by disease, accident, and predators, is very high, and only about one egg in every 200 contributes to the next generation. In my experiment I protected the larvae from the usual predators, the Tachinid fly, a species of Ichneumon, and birds, and I do not think many met accidental death, so that we are left with the conclusion that the recessive varieties are constitutionally less hardy than the wild type.

Heterozygotes of these varieties will have a better chance of survival in those cases where the harmful gene has the minimum effect, and so in the course of evolution, natural selection has made the genes recessive by permitting the survival only of those heterozygotes in which the effects of the genes are suppressed by the "gene complex" of the individuals.

In June 1947 I endeavoured to pair my sole *varleyata* male with a *dohrnii* female, but without success. I did, however, succeed in getting several pairings between the "normals" of the brood, and two of these pairings produced reasonable numbers of fertile ova. The ova were sleeved when about to hatch, and in pairing 1947G×G(1) 89 larvae were counted before hibernation. These were left sleeved on a plum tree, and 53 survived the winter, producing 47 pupae, all of which emerged between the 8th and 31st May 1948.

The male parent of this brood must have been a carrier of the var. *dohrnii* gene because all the normal males of its brood carried *dohrnii*, and two out of every three also carried the *varleyata* gene. The chance of the female parent carrying the *varleyata* gene was also 2 out of 3. So the chance that both parents carried *varleyata* was 4 out of 9. The

same chances also applied to the other brood reared, brood 1947G×G(2). So with either brood I had an almost even chance of rearing the *varleyata* and *exquisita* forms.

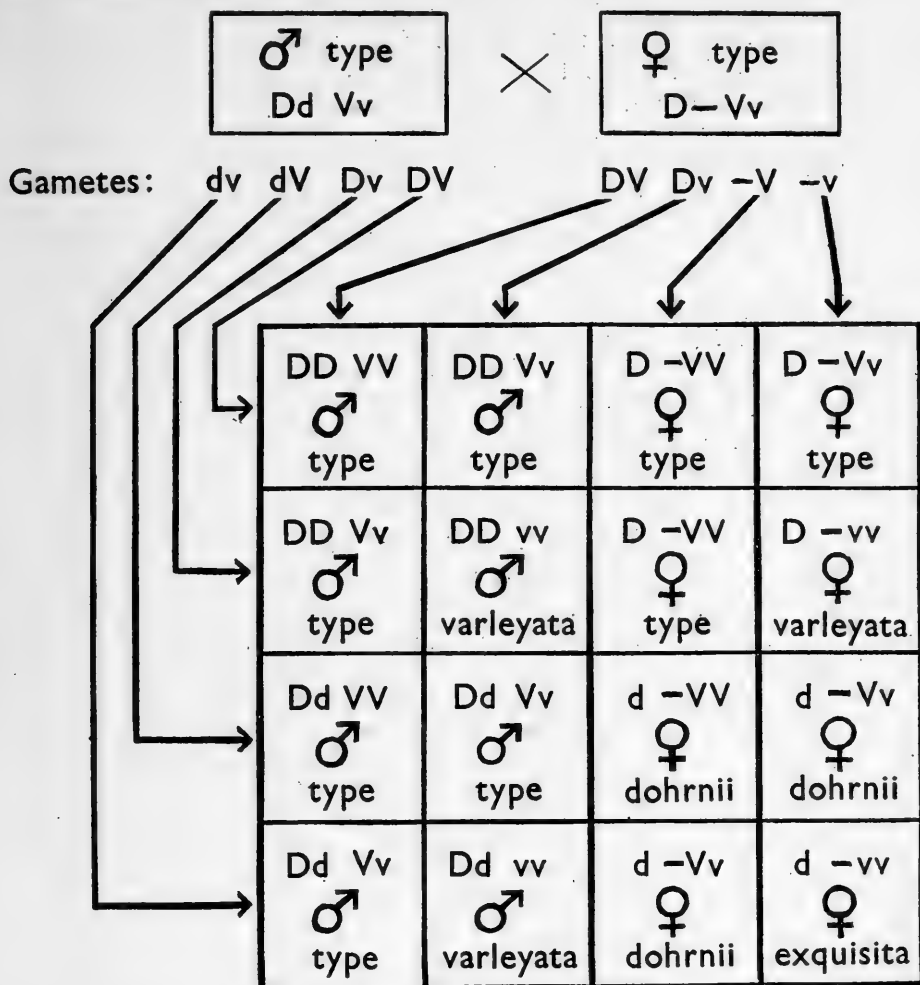


Fig. 2. Crossing of type ♂ with type ♀ (carriers); Theory of Brood 1947 G × G (2).

Brood 1947G×G(1) consisted of 26 males, all normal, 15 normal females, and 6 var. *dohrnii* females, so it would appear that one of the parents in fact had not been a carrier of *varleyata*. Brood 1947G×G(2) in the autumn of 1947 consisted of 136 larvae, but only 51 survived hibernation, and only 39 of these pupated. This brood produced:—Males—8 normals and 3 var. *varleyata*. Females—10 normals, 9 var. *dohrnii*, 4 var. *varleyata*, and 5 var. *exquisita*, so both "normal" parents must have been carriers of the *varleyata* gene.

The larvae in this brood did not suffer shortage of food, so the casualties must have been due to some other cause. This is reflected in the comparative survival rates for the varieties. By pure chance we should expect about one quarter of the brood to be var. *varleyata*; in

fact 12 out of 39 were *varleyata*. We should also expect about half of the females to be var. *dohrnii*; in fact 14 out of 28 were var. *dohrnii*.

In 1947 I took the opportunity of increasing my stock of *varleyata* and *exquisita* by obtaining from Mr. Newman a mating of a male var. *varleyata*, known to be carrying var. *dohrnii*, with a female of var. *varleyata*. Though I did not know it at the time it was in this brood that I obtained the genes which later caused the gynandromorphs to occur. At the same time I also obtained four larvae from a mating of *exquisita* male with *exquisita* female.

The *varleyata* brood, 1947V×V, comprised 80 ova which changed colour; later 52 larvae were counted before hibernation, and 36 survived the winter, producing 31 pupae. The 31 imagines all emerged between 12th and 22nd May 1948, and consisted of 16 male *varleyata*, 9 female *varleyata*, and 6 female *exquisita*.

When endeavouring to breed a species it is a great advantage to have the bulk of one's imagines emerge during a very short period. With *grossulariata* this can easily be arranged. I found that if the larvae were provided with deciduous foliage as long as it was available (a cultivated plum tree was usually the last to drop its leaves) and then caged on cut *Euonymus* shoots and placed in a cold and draughty shed, they remained dormant until the first mild day in February. They were then taken indoors and soon re-commenced feeding on *Euonymus*, and the resulting imagines all emerged during about a fortnight in April or May.

As my entomological breeding is only one of several hobbies I use those methods which require the least time spent on them. I usually count the ova in a brood and when the first larva emerges, it and the rest of the ova are tipped into a sleeve on a Black Currant bush. When all the leaves have been eaten the branch is cut off close to the sleeve, pushed in, and a fresh branch inserted. This takes less than five minutes.

Eventually the sleeve contains too much debris from several similar changes, so I decide to go through it. The branch with the old sleeve is cut off, taken indoors, one end opened, and the contents shaken out onto a cloth on the dining-room table. The larvae are collected with a camel-hair brush and a teaspoon, and dropped into a glass 1000 cc photographic measuring jar. A few fresh leaves in this removes the need for a lid.

I have already placed a new sleeve in position on a branch of Black Currant. The larvae are counted as collected, and when all the live ones are in the jar, the contents are tipped into the new sleeve, and the sleeve tied up. A brood of 200 larvae can in this way be dealt with in an hour, and the process does not require repeating more frequently than monthly.

In breeding on Mendelian lines much of the enjoyment comes from the age-old pastime of "Counting one's chickens before they have hatched", and to do this one requires to know the genetic constitution

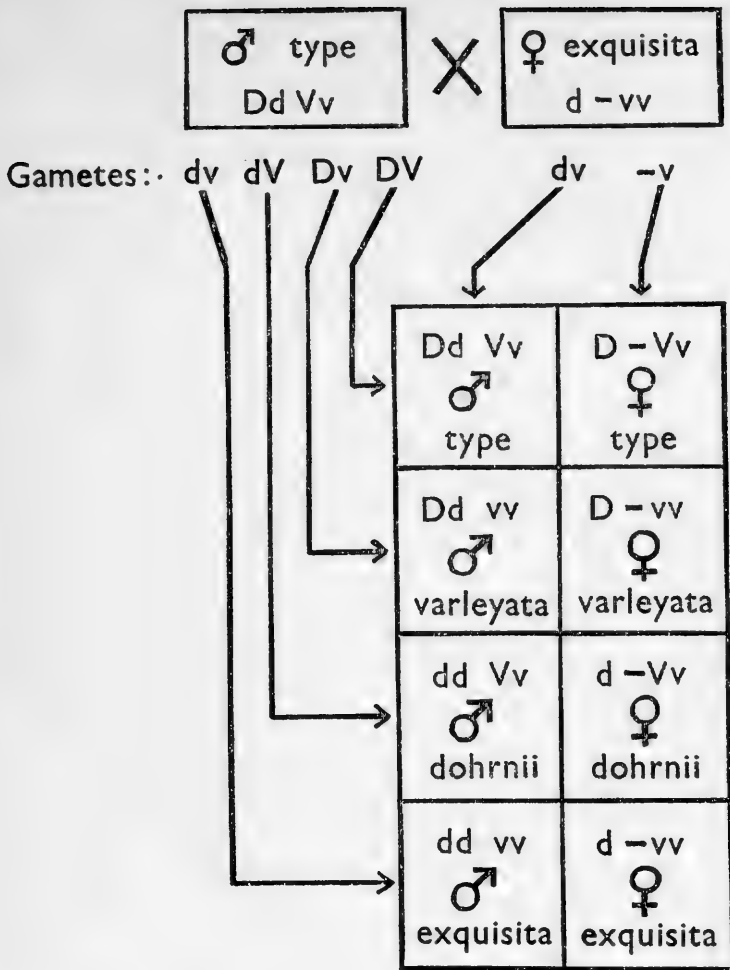


Fig. 3. Back cross of type ♂ (double carrier) to exquisita ♀ (double variety).

of both parents of each brood. Dealing only with the vars. *varleyata* and *dohrnii* there are 9 genetically distinct types of male, and 6 genetically distinct types of female, giving a possibility of 54 different matings. One wet evening I sat down and tabulated all of these, with the expected progeny of each. My tables showed immediately that 4 of the possible 54 matings would be of more interest than all the rest. These four are the two double-back-crosses, and the two auto-sexing back-crosses. The former produce equal proportions of the four forms in either sex, and the latter equal proportions of "Normal" and *varleyata* males, and *dohrnii* and *exquisita* females. In every case each form is composed of only one genetic type, so that at a glance one can say with certainty which imagines are carrying which of the varieties. Another advantage is that it is necessary to rear only one brood to have available all the parent forms required for future broods. The auto-sexing back-crosses have the advantage that the sex of every imago is discernible from a distance, and the only forms reared are those required for

the parents of the double-back-crosses. These considerations led me to concentrate my limited breeding facilities on these four matings.

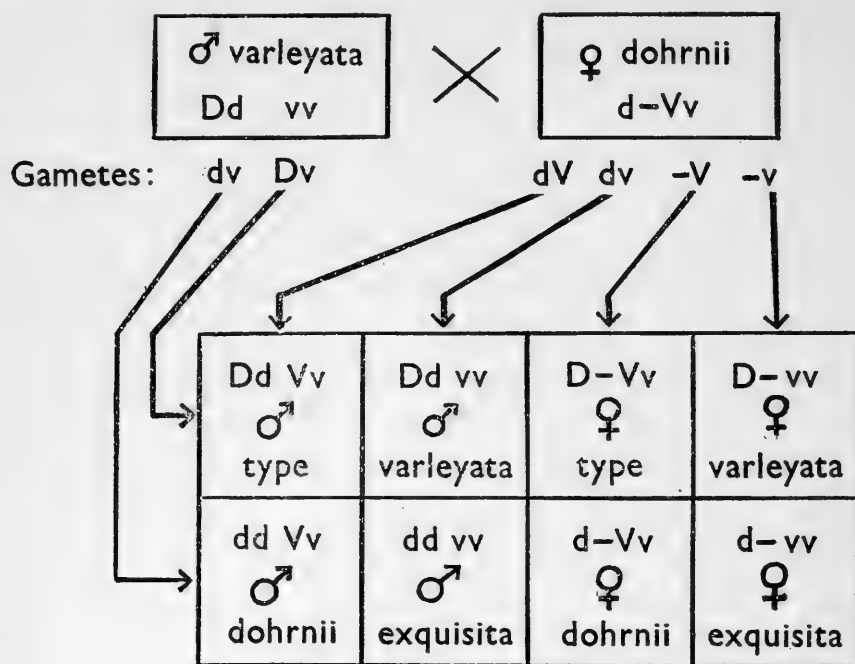


Fig. 4. Double back cross of ♂ *varleyata* (carrying *dohrnii*) with ♀ *dohrnii* (carrying *varleyata*).

In May 1948 I mated a male of var. *varleyata*, which was also carrying *dohrnii*, with a female of var. *dohrnii*, which was also carrying var. *varleyata*, thus making my first double-back-cross. 235 ova were deposited before 2nd June, and 101 larvae were counted on 2nd August, at the first re-sleeving. On the 22nd September 79 larvae remained but only 30 were alive on 31st January, when they were brought indoors, and 27 imagines emerged between 28th March and 16th April.

You will notice that each year my broods are emerging at an earlier date:—1947—June, 1948—May, 1949—March and April. An auto-sexing back-cross pairing was made on the 4th April 1949, between a male var. *dohrnii*, carrying *varleyata*, and a female var. *varleyata* from another brood, and the first imago emerged on the 27th July 1949, a life cycle of only 114 days. This brood, 1949 VI, continued to emerge indoors until 14th November, by which time I had reared 68 imagines from the 196 ova, and had two larvae hibernating out of doors in a small sleeve on *Euonymus*. These two larvae were not brought indoors at the beginning of February, and the imagines did not emerge until the 8th and 12th of June. Thus the emergences from this brood, the larvae of which were sleeved out of doors on Black Currant during the summer, were spread over a period of 10½ months.

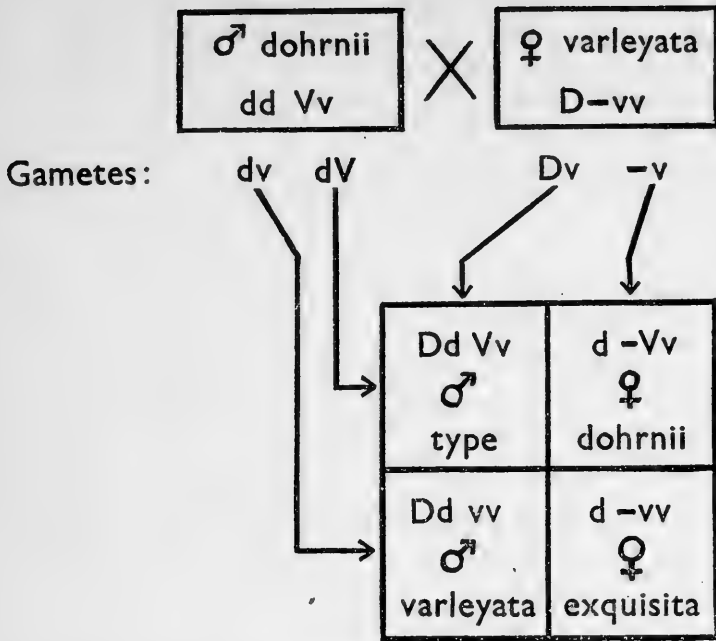


Fig. 5. Auto-sexing cross of  $\sigma^7$  dohrnii (carrying varleyata) with  $\text{♀}$  varleyata

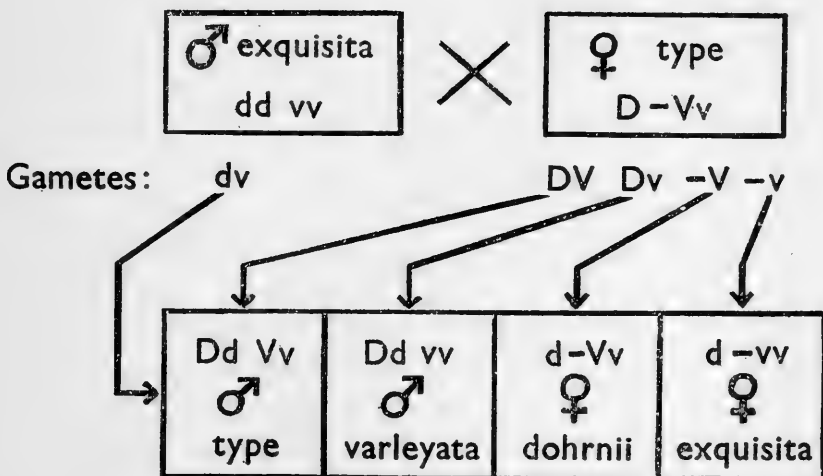


Fig. 6. Auto-sexing back cross of exquisita  $\sigma^7$  (double variety) with type  $\text{♀}$  (carrying varleyata).



An example of the other auto-sexing back-cross was reared at the same time. A mating on 6th April 1949 of male var. *exquisita* with female "normal" but carrying *varleyata*, produced 297 ova. There were 150 larvae on 19th June; 117 imagines were reared between 28th July and 14th November; one larva hibernating and the imago emerging on 21st May 1950. The shortest cycle in this brood, 1949 X, was 113 days, and the larvae had been sleeved out of doors from 1st May to their last instars.

A double-back-cross brood, 1949 VIII, was obtained from a mating on 5th April 1949 of "normal" male, carrying *varleyata* and *dohrnii*, with a female var. *exquisita*, and on 1st May was sleeved on a potted Black Currant bush in my greenhouse, which, though well ventilated, would have an appreciably higher average temperature than out of doors.

From 163 ova 39 imagines were reared, the first emerging on 31st July, a cycle of 116 days. In this brood there were 55 larvae on 7th June, but the sleeve and plant were badly contaminated with "honeydew" from aphids accidentally included in the sleeve, so the larvae were re-sleeved out of doors. 33 of the larvae had been brought indoors by 18th August and produced 30 imagines. The other 22 were still sleeved on a Black Currant bush on 20th August, when a half-blind gardener, whose hands were contaminated with D.D.T., accidentally cut off the branch and handled the sleeve. I changed it onto a fresh branch the next day, and on 3rd September removed 1 pupa and 10 large larvae indoors, re-sleeving the remaining 11 small larvae. 9 imagines emerged between 9th and 16th September from the larvae brought indoors, but in November only one larva remained alive of the 11 small larvae re-sleeved. I suspect that the casualties may have been due to contamination with D.D.T. The remaining larva was very dark, the colour generally retained during hibernation, and did in fact try to hibernate when brought indoors, but dried up during the winter.

It would appear that in this species the urge to hibernate is triggered-off by the cold weather of the autumn, and once triggered-off,\* a period of dormancy must occur before feeding can be resumed. As many broods have shown the species is not an essential hibernator, and it is quite possible to eliminate hibernation during the winter by rearing the larvae indoors in a warm room. By so doing I have had the moths emerge during all the winter months. In a temperature which varied only between 59° F. and 71° F. the shortest cycle recorded was 130 days.

Another double-back-cross brood, 1949 VII, from a mating on 5th April 1949 of "normal" male, carrying both vars. with female var. *exquisita*, produced 240 ova. On 1st May these were sleeved in the greenhouse. On the 10th of June 64 larvae were counted and re-sleeved

\*Way Smith & Hopkins (1950) have shown in *Diatariseu* that the "dormancy" is "triggered off" by the decrease in daylight hours.

out of doors. Thus this brood spent the longest time in the warmer but drier atmosphere of the greenhouse, and yet the first imago did not emerge until the 23rd of August, giving a cycle of 140 days, and only 21 of the 48 imagines emerged the same year, compared to 185 out of 188 in the two broods sleeved out of doors on 1st May.

May I say a few words about obtaining matings in this species. I started with the idea that a current of fresh air was necessary, and a fairly large cage, so that my first matings were made in muslin cages of about  $1\frac{1}{2}$  to 2 cubic feet volume, strung on a miniature clothes line across the front porch of our house. I found that pairing usually took place after I had gone to bed at night, and ceased before I arose in the morning so that if I wanted to witness it I had to get up in the middle of the night. At that hour it was cold standing in the porch in my pyjamas, and also my family objected to these "house decorations", particularly my father, after he had bumped into one in the dark. So I then tried hanging the cages under a small open window in the lounge, and found this quite as satisfactory, and definitely warmer for my nocturnal visits. The next improvement was to transfer the cages to my bedroom, so that I did not have to come downstairs in the night, though I still had to get out of bed. I take off my hat to that member of the "South London" who really solved his problems. A married man, his wife objected to being awakened when he got out of bed, so he took to bed with him a torch, and placed his pairing cage under the bed. He could then lean over and have a look without getting out of bed and without switching on the room light.

I found that I could obtain pairings in an unventilated room during cold winter months, and in much smaller cages, only about 3" in diameter and 6" high. I noticed that when I switched on the light at, say, 3.18 a.m., the males flew around and frequently mated while I was watching them. As they flew towards the light I used to turn the cage so that the female was in the direction of the light, and a collision often produced a mating. As a result I have a record reading "Seen to pair at 3.20 a.m. B.S.T. 9-5-51", and the record of the following brood reads "Seen to pair at 3.20½ a.m. B.S.T. 9-5-51. I also noted that some moths paired more than once. I recorded for brood 1951 No. 9 "Seen paired 8 a.m. 16-10-51; paired 2nd time 11.30 p.m. B.S.T. 20-10-51; paired 3rd time 9.10 p.m. G.M.T. 21-10-51; seen paired 4th time 8 a.m. 23-10-51". Seeing a mating taking place was, I found, no guarantee of fertility. The best indication was for a fair batch of ova, 25 or so, to be deposited during the evening after the mating, and I found that I had to make 2 to 3 matings to obtain one of good fertility.

During the first week of August 1949 I obtained about a dozen pairings, three of which are of particular interest in that they produced 10 gynandromorphs in all, and one further gynandromorph occurred in a brood reared by Mr. Goodban, from a pairing which I made on 19th May 1950.

Regarding the genetics of the gynandromorphs I can give little proof. I understand that current opinion is that gynandromorphs are the result

of the double fertilisation (by two sperms) of bi-nucleate ova. In normal cases, prior to the production of the unfertilised ovum, a cell division takes place without the usual division of each chromosome. In its place the chromosome pairs separate into two sets of singletons, and one of these sets is extruded from the cell and lost, thus reducing the number of chromosomes in the cell to half the normal. As each sperm contains one set of singleton chromosomes the union of sperm and ovum to form the fertilised egg brings the cell content of chromosomes back to the normal pairs.

The bi-nucleate ovum is due to the retention of both singleton sets of chromosomes within the cell, instead of the extrusion of one set. The two nuclei are fertilised by two separate sperms, but unite to produce only one imago, portions of which develop from each fertilised nucleus. As one of the two nuclei contains an X chromosome and the other a Y chromosome, and each sperm contains an X chromosome, some portions of the individual will be male and other portions female. The gynandromorphs which I reared varied from one individual which appeared to be all male var. *dohrnii* except for one antenna, which was female, to others in which there was a clear-cut central longitudinal dividing line between the sexes, one half being male and the other female.

All four broods which produced the gynandromorphs were double-back-crosses, so that any of the four forms could occur in either sex, and the chances that a gynandromorph would also be dimorphic in colour pattern were three out of four.

In the commercially-bred Silkworm, *Bombyx mori* L., gynandromorphs have been bred, and have been shown to be due to a recessive gene.

Dr. Cockayne has suggested that the same is probably true of the gynandromorphs of *Abrazas grossulariata*. I have not been able to prove this; it would require the rearing of many more broods than I can handle, and my stock of the strain has now died out. However, from my records, I have been able to work backwards and so trace the probable transmission of a recessive gene for gynandromorphism from each of the gynandrous broods back to one of the pair of var. *varleyata* imagines which I obtained from Mr. Newman three generations earlier.

Assuming that the female parent of a gynandromorph is the recessive, then both parents of such a female are at least carriers of the recessive gene, and one parent of each carrier must also be a carrier. The recessives occurred in broods 1949 VI, VII, and X, so that carriers occurred in broods 1948 IV, VII, VIII, and X, and also possibly in 1948 I, and one parent of each of these broods emerged from the 1947 V×V brood.

In prediction of the future one can say that the uni-sexual brothers and sisters of the gynandromorphs are at least carriers, and that by mating these approximately one quarter, or more, of the females reared should deposit bi-nucleate ova. Unfortunately there is no visual distinction between a female which will deposit bi-nucleate ova and one which will not, so that one has to rear a fair number of broods.

## A NOTE ON THE OAK MARBLE GALL WASP (HYM., CYNIPIDAE).

By M. NIBLETT, F.R.E.S.

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In 1898 Beijerinck (1) carried out experiments with *Cynips kollari* Htg. bred from the familiar Marble Gall of the Oak, sleeving the insects on shoots of *Quercus robur* from which he obtained no results, and then on those of *Quercus cerris* where he obtained the small bud gall of *Andricus circulans* Mayr. He repeated these experiments in 1901 and obtained similar results. He failed however to obtain *kollari* galls by sleeving *circulans* on *Q. robur*. He published the results of these experiments in 1902.

In 1941 (2) I published some notes on *Cynips kollari* in which I expressed some doubts about the results claimed by Beijerinck, for which I was taken to task by Prof. Dr. van Leeuwen (*in litt.*) who knew Beijerinck personally, and considered him to be a most careful and painstaking observer. I was not alone in having these doubts as the two species of oaks were so different that it was thought a Cynipid coming from one would be most unlikely to oviposit on the other species. For a number of years I had tried to locate trees of *Q. cerris* in localities where I had found galls of *kollari*; in 50 localities visited frequently or at intervals over a number of years and in which I had found *kollari* galls, I found *cerris* growing in 20 of them, but in the others I was unable to locate any trees of *cerris* which further added to my doubts. However in 1940 *kollari* galls appeared on a tree of *Q. robur* growing in my garden, and as the nearest trees of *Q. cerris* are in a Park a mile away beyond a built-up area, it was obvious that if Beijerinck's claim were correct the insects which had caused these galls must have been brought to my oak by wind, or air currents, showing that *cerris* need not be in close proximity to the trees of *robur*.

On 27.iv.48 I sleeved 16 ♂♂ and 17 ♀♀ of *Andricus circulans* on a branch of a tree of *Q. petraea* growing in the garden, and on 30.vii.48 found that one *kollari* gall had developed. Wishing to obtain further and more definite evidence I planted later some young *Q. robur* in pots. These were kept under cover and on 30.iv.49 a series of 12 *circulans* were sleeved upon the most promising looking one, with the result that on it by 23.vi.49 four galls of *kollari* had developed. Several sleeveings of *kollari* on *Q. robur* all gave negative results. I was unable to experiment by sleeving *kollari* on *cerris* as the only plant of that species I had died. I was however quite satisfied that the claim made by Beijerinck was correct and that *circulans* was the alternate generation of *kollari*.

About the same time Marsden-Jones (3) was carrying out similar but much more elaborate experiments than mine. In these he obtained similar results, but also succeeded in obtaining *circulans* galls from sleeved *kollari*.

In 1917 Rohwer and Fagan (4) altered the generic name of *Cynips kollari* Htg. to *Adleria*, this now becomes a synonym and we have to know the agamic generation as *Andricus kollari* Htg., with the sexual generation remaining as *Andricus circulans* Mayr, or as *A. kollari* a.g. and *A. kollari* Htg. form *circulans* Mayr s.g. if we follow Kloet and Hincks.

I might add that there are different ideas both here and on the Continent, about the method of indicating which is the agamic and which the sexual generation.

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nudum, Tricholoma .....	94	terrestris, Thelephora .....	86
ochroleuca, Russula .....	86	terreum, Tricholoma .....	94
ostreatus, Pleurotus .....	84	torminosus, Lactarius .....	94
pantherina, Amanita .....	86	triplex, Geaster .....	92, 93, 94
perennis, Polyporus .....	86	tuba, Clitocybe .....	94
perlatum, Lycoperdon .....	86	turpis, Lactarius .....	86
peronatus, Marasmius .....	94	ulmarius, Fomes .....	94
petaloides, Pleurotus .....	94	vaginata, Amanitopsis .....	94
phalloides, Amanita .....	94	varius, Cortinarius .....	94
picaceus, Coprinus .....	94	vellereus, Lactarius .....	94
polygramma, Mycena .....	94	versicolor, Polystictus .....	94
praecox, Pholiota .....	8	versipellis, Boletus .....	86, 91
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prunulus, Clitopilus .....	93, 94	virescens, Russula .....	88
psittacinus, Hygrophorus .....	94	virgineus, Hygrophorus .....	94
puniceus, Hygrophorus .....	94	viscidus, Boletus .....	92, 94
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quietus, Lactarius .....	86	vulgare, Crucibulum .....	15
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rhacodes, Lepiota .....	94		
		MYCETOZOA.	
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Appendix B Continued Overleaf

shop which keeps him, the busy surgeon with few hours to spare, or the clerk who posts books as his business and sugars the trees for "nocturnal Lepidoptera," as his pleasure—may have lit upon it in one of his rare holidays. From egg to caterpillar he has hatched it. He has bred it through all its brief voracity as an unsightly larva, and patiently waited for what, was in store for him while it lay swaddled as mummy-like pupa, until one day he was rewarded by its bursting its bonds, and appearing as a perfect insect, with all manner of facts and confirmation of theories on its wings. To "hunt butterflies" is regarded by some slenderly-informed people as the acme of puerility, well enough for children, but scarcely suitable for adults with funds enough to garner editions which they never open, and engravings so costly that they are afraid to expose them to the light. A brief study of such an Exhibition as that to which we refer ought to teach a very different lesson.

The man who limits himself to the study of British butterflies has by no means a difficult task before him, if he aspires to know nothing more about them than the names to which they are scientifically entitled. But when the investigation of their life histories is entered upon, and all their varying stages are considered, their food and their deprivations





# South London Entomological Society,

ESTABLISHED 1872.

ASSEMBLY ROOMS, 104, WESTMINSTER BRIDGE ROAD, S.W.

(Side Entrance).

## PATRONS.

SIR JOHN LUBBOCK, Bart., M.P., F.R.S., &c.  
R. McLACHLAN, Esq., F.L.S., &c.  
E. C. RYE, Esq.  
HENRY T. STANTON, Esq., F.R.S., &c.

The Society has been formed to promote Entomological Science in South London. Meetings of the Members are held every alternate Thursday, from 8 to 10 p.m., in the above Assembly Rooms, when papers are read, exhibitions of specimens made, and discussions take place. A Library is being formed as rapidly as funds will permit, all surplus money being devoted to the purchase of books.

The Society's room is easy of access from all parts of London, and the Committee cordially invite the co-operation of all entomologists, especially those who are willing to further the objects of the Society by reading papers and exhibiting their captures. Since its formation the Society has rapidly increased in numbers, a large portion of the Members being experienced collectors.

## SUBSCRIPTION:

Six Shillings per Annum, with an Entrance Fee of One Shilling.

All Communications should be addressed to either of the Hon. Secretaries,

Mr. G. C. CHANEY, 274, Vauxhall Road, S.E.  
Mr. W. C. CHANEY, 9, Gillingall Road, Peckham, S.E.

## SCIENTIFIC NEWS.

### SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.

This active and energetic society held its annual Exhibition at the "Bridge House" Hotel, London Bridge, on October 17th and 18th. The specimens brought together illustrated almost every department of natural history, and we feel ourselves well within the mark in saying that a display so beautiful, so varied, and, above all, so instructive, has certainly never been previously brought together on the south bank of the Thames.

The Exhibition occupied three large rooms. In the Nelson Room, on the first floor, we noticed a very extensive assortment of microscopes, microscopic objects, and apparatus. So richly stocked, in fact, was this department that an entire day would have been requisite to inspect everything worth seeing. Next, we noticed a display of birds, reptiles, fishes, and insects; a collection of rocks and fossils, illustrative of the geology of the South-East of England, contributed by Messrs. T. Leighton, F. D. Power, and T. D. Russell. Mr. Livesey contributed some good osteological specimens, whilst Miss M. E. Adkin, Miss F. Billups, and Messrs. Pearce and Step had furnished a good botanical collection. Lastly, that indefatigable naturalist, Mr. J. T. Carrington, and Mr. E. Step had brought together an assortment of fungi—a department too much neglected. In the Wellington Room, on Wednesday, 17th, Mr. R. May delivered two lectures, one on "The Wonders of Minute Vegetable and Animal Life," at 8 p.m., and one on "Curious Houses and Queer Tenants," at 9.30 p.m.

On Thursday evening, at 7 p.m., in the same room, the Scipion Company gave a beautiful exhibition of photo-micrographic slides, whilst at 8.15 Mr. G. Day gave a further display of micro-photographic slides illustrative of entomology, geology, &c.

The main display, however, was in the ball-room on the third floor, which was converted into a well-stocked museum. The assortment of birds, birds' eggs, and nests was decidedly good. As regards the display of insects, the Lepidoptera were evidently the favourites. We particularly notice a specimen of *Daphnis nerii* caught at Poplar. Oedoptera played but a subordinate part, though the collection of British beetles furnished by the President, Mr. T. R. Billups, comprised nearly all the species known to occur in Britain. The collections of Mr. J. H. Leech and W. West were also well deserving of admiration.

As for the "neglected orders," a collection of Neuroptera had been furnished by Mr. R. McLachlan, whilst assortments of Hymenoptera, Hemiptera, and Diptera were shown by Messrs. Billups and Verrall. A collection of Molluscs was sent in by Mr. F. G. Fenn, and a nice selection of corals and sponges by Mr. W. Mangr. We can only briefly glance at the specimens illustrative of pathology sent by Mr. W. Rout, and the collection of plants collected by Mr. A. Pearce in a journey from San Diego to the Sonora Pass, California.

With the entire display we were not merely satisfied, but delighted; and we hope the immense trouble taken by the committee and their friends will redound to the benefit of the society. It cannot be too widely known that one of its objects is to afford to youths who have a taste for Natural History that practical guidance which books alone fail to impart.

## THE STANDARD.

THURSDAY, OCTOBER 18, 1888.

### SOUTH LONDON NATURAL HISTORY SOCIETY.

—The Annual Exhibition of the South London Entomological and Natural History Society was opened last night, at the Bridge House Hotel, London Bridge, and will be on view again to-morrow. The Society, which has for its object the diffusion of biological science by means of papers and the formation of typical collections, was established twenty-seven years ago, and has received, year by year, an accession of members, which has now reached a very high standard. The Exhibition is arranged in three rooms. In the first are to be seen microscopes, microscopic objects and apparatus, specimens of stuffed birds, fish, reptiles, and insects, and, in particular, a most interesting and instructive collection of fungi, shown by Mr. J. T. Carrington and Mr. E. Step. The other rooms contain splendidly mounted and arranged collections of butterflies, moths, shells, corals, sponges, stuffed birds, and eggs, besides a large number of drawings, paintings, photographs, and books illustrative of the science of Natural History. During the evening, Mr. W. R. May delivered two lectures on "The Wonders of Minute Vegetable and Animal Life," and "Curious Houses and Queer Tenants," both of which were listened to with interest by large audiences. The Exhibition remains open till this evening.

## THE DAILY CHRONICLE.

THURSDAY, OCTOBER 18, 1888.

### SOUTH LONDON NATURAL HISTORY SOCIETY.

The annual exhibition of the South London Entomological and Natural History Society was opened last night at the Bridge House Hotel, London Bridge.

In consequence of the great number of persons who in previous years visited the exhibition on the first night it was arranged to make the first night this year a private view. The object of the society, which has a long list of members, is the diffusion of biological science, by means of papers and discussions, and the formation of typical collections. The two best rooms in the Bridge House Hotel have been engaged for the exhibition, and they are crowded with interesting objects. On the first floor there were a great number of microscopes and microscopic objects and photo slides. Dr. Scudder, and Messrs. B. W. Aldin, A. E. Cook, E. Cook, W. E. Dawes, and W. Turpin have contributed a numerous collection of birds, fish, reptiles, insects, &c., which were inspected with great interest. In the geological section, Mr. T. Leighton exhibited a large assortment of rocks and fossils, illustrating the geology of the south-east of England. In the larger room on the third floor there was one of the finest collections of Lepidoptera ever brought together. The collection, long these islands occupy the whole of one side of the spacious room, and contain specimens of almost every known species. One of the most interesting exhibits in this room was a unique collection of fish bones, made and used by the natives of Alaska, Greenland, Fiji, Solomon's Island, &c., lent by Mr. E. Lovett; although differing entirely from English fish-bones, both in material and design, each one shows considerable ingenuity, and they are said to have been used for catching both large and small fish. There is also a large collection of valuable books of natural history lent by Mr. J. Wheldon, and drawings, paintings, etchings, and photographs, by Messrs. H. Burton and Son, C. S. Gresson, S. Mosley, W. B. Tegetmeier, and F. W. Power. Birds, birds' eggs and nests, of great variety, taken from all parts of the world, were on view. Mr. W. Mangr sent a splendid collection of corals and sponges. Among the other exhibits were some fine specimens of coleoptera, hymenoptera, diptera, neuroptera, and mollusca, while in the botanical section, Messrs. G. S. Cooper exhibited some curious English plants, and Mr. W. A. Pearce, a quantity of plants collected en route from San Diego to Sonora Pass, California. A selection of music was performed during the evening by Mr. G. Augustus Holmes, and two lectures were delivered by Mr. W. R. May, the first entitled "The Wonders of Minute Vegetable and Animal Life," illustrated with the oxyhydrogen light; and the second, "Curious Houses and Queer Tenants." The exhibition remained open during Thursday evening, when the Scipion Company gave an exhibition of photo-micrographic slides, and Mr. G. Day an exhibition of micro-photographic slides.

## THE KENTISH MERCURY.

OCTOBER 19, 1888.

### SOUTH LONDON NATURAL HISTORY SOCIETY'S ANNUAL EXHIBITION.

The annual exhibition of the South London Entomological and Natural History Society was opened Wednesday evening at the Bridge House Hotel, London Bridge. In consequence of the great number of persons who in previous years had visited the exhibition, it was deemed necessary to make the opening night a private view. Last evening there was a crowded attendance, the two best rooms of the Bridge House Hotel being used for the exhibition, and they were well filled with interesting objects. Amongst other exhibits were two enormous specimens of *Lamprologa* and *Darwin*, lent by Mr. J. Wheldon; also a case of *Pallas* and *Proton*, which in England, until this year, had been a very uncommon class of birds. Amongst other exhibits were—Microscopes—Messrs. F. W. Tutt (Greenwich), C. H. Croker (New Cross), and P. C. Billups (Peckham).

LEPIDOPTERA.—British: Mr. A. D. Farr (Stone, Staffordshire), Yellow Underwings, collected chiefly in Scotland; Mr. H. Aldin (Molesey, Surrey), Irish and English; Mr. S. Stevens (Farn-Hill), one row of large caterpillars, now extinct; Mr. W. H. Day (Leeds), a most complete collection of British Butterflies, including *Heath's* *Heath's*, also a collection of scarce *Heath's*, now very rare. Mr. T. Westcombe (Paris), several drawings of British *Nettles*, showing great variation in colour; Mr. J. Wheldon, a collection of *Heath's* *Heath's*, a small collection. European: Mr. A. H. Jones (Edinburgh), Mr. A. E. Cook (Leeds), a most complete collection of *Heath's* *Heath's*, a small collection. Mr. A. H. Jones (Edinburgh), Mr. A. E. Cook (Leeds), a most complete collection of *Heath's* *Heath's*, a small collection. Mr. A. H. Jones (Edinburgh), Mr. A. E. Cook (Leeds), a most complete collection of *Heath's* *Heath's*, a small collection.

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## THE SOUTH LONDON MAIL.

SATURDAY, OCTOBER 20, 1888.

### SOUTH LONDON NATURAL HISTORY SOCIETY.

The annual exhibition of the South London Entomological and Natural History Society was opened on Wednesday night at the Bridge House Hotel, London Bridge. In consequence of the great number of persons who in previous years visited the exhibition on the first night it was arranged to make the first night this year a private view. The object of the society, which has a long list of members, is the diffusion of biological science, by means of papers and discussions, and the formation of typical collections. The two best rooms in the Bridge House Hotel were engaged for the exhibition, and they were crowded with interesting objects. On the first floor there were a great number of microscopes and microscopic objects and photo slides. Dr. Scudder, and Messrs. B. W. Aldin, A. E. Cook, E. Cook, W. E. Dawes, and W. Turpin contributed a numerous collection of birds, fish, reptiles, insects, &c., which were inspected with great interest. In the geological section, Mr. T. Leighton exhibited a large assortment of rocks and fossils, illustrating the geology of the south-east of England. In the larger room on the third floor there was one of the finest collections of Lepidoptera ever brought together. The collection, long these islands occupy the whole of one side of the spacious room, and contained specimens of almost every known species. One of the most interesting exhibits in this room was a unique collection of fish bones, made and used by the natives of Alaska, Greenland, Fiji, Solomon's Island, &c., lent by Mr. E. Lovett; although differing entirely from English fish-bones, both in material and design, each one shows considerable ingenuity, and they are said to have been used for catching both large and small fish. There was also a large collection of valuable books of natural history lent by Mr. J. Wheldon, and drawings, paintings, etchings, and photographs, by Messrs. H. Burton and Son, C. S. Gresson, S. Mosley, W. B. Tegetmeier, and F. W. Power. Birds, birds' eggs and nests, of great variety, taken from all parts of the world, were on view. Mr. W. Mangr sent a splendid collection of corals and sponges. Among the other exhibits were some fine specimens of coleoptera, hymenoptera, diptera, neuroptera, and mollusca, while in the botanical section, Messrs. G. S. Cooper exhibited some curious English plants, and Mr. W. A. Pearce, a quantity of plants collected en route from San Diego to Sonora Pass, California. A selection of music was performed during the evening by Mr. G. Augustus Holmes, and two lectures were delivered by Mr. W. R. May, the first entitled "The Wonders of Minute Vegetable and Animal Life," illustrated with the oxyhydrogen light; and the second, "Curious Houses and Queer Tenants." The exhibition remained open during Thursday evening, when the Scipion Company gave an exhibition of photo-micrographic slides, and Mr. G. Day an exhibition of micro-photographic slides.

## THE PEOPLE.

SUNDAY, OCTOBER 21, 1888

BUCKLAND, JUNIOR.

I was really very sorry to be unable to attend the annual exhibition of the South London Entomological and Natural History Society, as invited, but I am always very busy, and could not possibly and time. The chief object of this society is a very laudable one, viz. the popularisation of natural history—and it seems to have succeeded, almost all people visiting the exhibition on the first night last year.

## THE DAILY NEWS.

FRIDAY, OCTOBER 19, 1888.

### SOUTH LONDON NATURAL HISTORY SOCIETY.

An interesting exhibition of specimens illustrative of natural history, and especially of entomology, was opened by this society in their rooms at the Bridge House Hotel on Wednesday evening, and closed last night. The collection embraces, among fossils, the skulls and teeth of elephants, rhinoceros, and mammoth found in the London basin. A fine fish and bone collection from the island of the South Pacific and from the coast of North America show great similarity in construction, chiefly of bone and shell, and are in good preservation, though dating from very remote antiquity. Numerous nests and cases of eggs of wild and of more ordinary British birds are exhibited by Mr. J. A. Cooper and Mr. D. J. Allen. A model of the great ant's egg coloured to natural presents of course an exact facsimile of the real thing, and is a valuable curiosity. Mr. Cooper shows also a case of *Pallas* and *Proton*, and a fine fish and bone collection from the island of the South Pacific and from the coast of North America show great similarity in construction, chiefly of bone and shell, and are in good preservation, though dating from very remote antiquity. Numerous nests and cases of eggs of wild and of more ordinary British birds are exhibited by Mr. J. A. Cooper and Mr. D. J. Allen. A model of the great ant's egg coloured to natural presents of course an exact facsimile of the real thing, and is a valuable curiosity. Mr. Cooper shows also a case of *Pallas* and *Proton*, and a fine fish and bone collection from the island of the South Pacific and from the coast of North America show great similarity in construction, chiefly of bone and shell, and are in good preservation, though dating from very remote antiquity. Numerous nests and cases of eggs of wild and of more ordinary British birds are exhibited by Mr. J. A. Cooper and Mr. D. J. 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**TY PRESS,**

**OCTOBER 20, 1888**

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**ENTOMOLOGICAL AND  
HISTORY SOCIETY.**

g last, at the Bridge House Hotel,  
society opened its annual exhibition.  
established some fifteen years ago,  
diffusion of biological science, by  
discussions, and the formation of  
scribe here the beautiful collections  
th were really only visible by the  
d be out of the question altogether,

. Butterflies and moths in every  
r-occupied the principal space, and  
thousands. The collection of eggs,  
hundreds, were very interesting to

reptiles of many kinds were exhibi-  
Cook, Mr. Dawes, Mr. Turpin, and  
the geological branch an interest-  
sails, illustrating the formations of  
and was shown by Mr. T. Leighton.

ning lectures were delivered by Mr.  
"Wonders of Minute Vegetable and  
rious Houses and Queer Tenants,"  
ith much interest. The exhibition  
ings of Wednesday and Thursday.

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**TH LONDON**  
**ID NATURAL HISTORY**

# THE SOCIETY'S Proceedings and Transactions

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1909-10	...	...	5	0	1938-39	...	...	11	0*
1911-12	...	...	4	6+	1939-40	...	...	10	0+
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1915-16	...	...	5	0+	1945-46	...	...	15	0+
1916-17	...	...	3	6+	1946-47	...	...	22	6*
1917-18	...	...	3	6+	1947-48	...	...	30	0*
1918-19	...	...	4	0+	1948-49	...	...	25	0*
1919-20	...	...	5	0+	1949-50	...	...	20	0*
1920-21	...	...	5	0	1950-51	...	...	15	0*
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1923-24	...	...	10	6+	1952-53	...	...	17	6*

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THE STANDARD.  
FRIDAY, OCTOBER 19, 1888.

After a Summer of Exhibitions—Italian, Irish, and Danish—a display of Butterflies by amateur entomologists may seem a somewhat tame affair. It is even possible that the ignorant or the rabid may scoff at the modest exposition of Natural History objects which the South London biologists have opened in their rooms hard by London Bridge. Year after year, the members of the Society bring together, for the instruction of the few who care to examine them, the treasures of their cabinets. Sponges and stuffed birds, reptiles, fishes, and fungi, corals, shells, and drawings of them, are collected. But the insects seem the principal objects in the cases; and of these the butterflies and moths attract the greatest amount of attention. No doubt, in the British Museum a vastly finer assortment is stored away. But the very pretences of the accumulated treasures of the right-entrance in the Bloomsbury galleries, whilst in an amateur display every specimen is of interest and has a local history attached to it. It was caught in this meadow or netted by that stream. It is the visible outcome of days of pleasant rambles—the pearl of great price which was sifted out of the crumbling trunk of some rotten tree. The entomologist who exhibits it now—and has most probably read a "Paper" on it during the Summer—knows its value. He appreciates it, in a way, for its own sake, not for its beauty, or even for its rarity, though, as likely as not, it is "new" to Surrey or to Kent, perhaps "new" to the British fauna,—or who knows?—may be a novelty of which Science has hitherto not taken cognisance, and in the annals of Zoology bears the Latinised name of its happy discoverer. Still better, the moth, or the butterfly—*Sphinx* or *Bombix*, or *Gnathocentrus*, a hardworking *Ornithoptera*, a *Parnassius* Apollo, with its semi-transparent wings spotted with black or vermillion, a clouded yellow *Colias*, or a pea-cock *Vanessa*, gay with all the colours of the rainbow—may be the embodiment of some fact of which neither DARWIN, nor BATES, nor WALLACE, nor FRITZ MÜLLER ever dreamt. The humble amateur—who all day keeps the chrysalis which he has, the busy surgeon with few hours to spare, or the clerk who reads books as his business and sugs the trees for "nocturnal Lepidoptera," as his pleasure—may have lit upon it in one of his rare holidays. From egg to caterpillar he has watched it. He has level it through all its brief voracity as an unsightly larva, and patiently waited for what was in store for him while it lay swaddled as mummy-like pupa, until one day he was rewarded by its bursting its bonds, and appearing as a perfect insect, with all manner of facts and confirmation of theories on its wings. To "hunt butterflies" is regarded by some slenderly-informed people as the acme of purity, well enough for children, but scarcely suitable for adults with funds enough to garner editions which they never open, and engravings so costly that they are afraid to expose them to the light. A brief study of such an Exhibition as that to which we refer ought to teach a very different lesson.

The man who limits himself to the study of British butterflies has by no means a difficult task before him, if he aspires to know nothing more about them than the names to which they are scientifically entitled. But when the investigation of their life histories is entered upon, and all their varying stages are examined; their food and their depredations in each of these stages noted, he will find that years will slip away without the pleasant task being half finished. When the philosopher at the Autocrat's breakfast table indignantly rejected the title of entomologist, being conscious of no loftier name than that of colporteur, or even of "scavenger," he proved himself aware of the superlativity of the order to which he devoted his toilsome days and harmless nights. But the lepidopterists, for whose comparatively narrow field he had something like contempt, can claim a scarcely less legion-like range of objects on which to expend their care. Every scale on every butterfly's wing is an object of beauty and of the most intricate design, and there is not a single species the range of which is exactly the same as that of its nearest relation, or the transformations of which do not reveal some curious difference. A Dutch entomologist is said to have made fifteen different dissections of the cockchafer's thigh before he considered the labour he had undertaken closed; and yet there is not an insect, from the largest to the most minute, which is not equally worthy of the same pains from any man who does not regard all toil wasted, except what is spent in eating and drinking, making money, and spending it. The lepidopterist is, however, not without strong claims on the gratitude of mankind, for through his inquiries the history of many of our most destructive garden and field pests has been made clear, and their mischievous career checked at an early stage. So useful, indeed, has the economic entomologist proved, that nearly every

State of the American Union supports an Entomological Bureau, and now that an Agricultural Department has been established in Whitehall, an entomologist has been one of the first of its appointments. Even if he goes no further than the circumvention of the caterpillars of the sixty-six British butterflies and the nineteen hundred and ten species of British moths, he will have his hands full, without attending to the beetles and the flies, the locusts being happily not within his province. But the annual South London Exhibition—which, temporary though it is, constitutes the only museum south of the Thames to which the world at large is free—ranges over a wider field than the British insects. And the moment we pass beyond the limits of these Islands, the number of butterfly species increases. In Europe there are no fewer than four hundred. Within an hour's walk of Paris, in France, BATES found seven hundred species, while over the whole world, though it is not one half explored from the entomological point of view, there must be over two hundred thousand different kinds of lepidopterous insects. Each of these forms has its own life history, from the egg to the perfect insect, its own plants on which it preys as a caterpillar, and its own food when it attains to adult condition, though thousands of them are separated from their nearest allies by differences the most minute.

It is these facts that have rendered Entomology of such scientific importance. In the days before DARWIN a moth was simply a moth, or a butterfly a butterfly—one more addition to the corked drawers of the cabinet, another name added to the ever-lengthening lists in the works treating of the order to which it belonged. But since the strange discoveries which led to DARWIN'S theory, a Naturalist no longer values a "specimen" simply as a "specimen," but as a link between two others already known, or as the material proof of some law hitherto sought for in vain. The important observations regarding mimicry among insects form an apt illustration of this. We have, for example, moths whose wings are coloured and veined like the fallen leaves on which they lie motionless, hunched and grayer than the flowers, and the false caterpillars which, by mimicking the appearance of poisonous snakes, are shunned by birds, and thus have an advantage in "the struggle for existence." In some butterflies and moths the gaudy wings of the males give place in the females to less conspicuous colouring, so that the two insects look like entirely different species, and, no doubt, have not infrequently been described as such. Mr. WALLACE explains this on the principle of the female being generally slower in flight, and requiring several days to deposit her eggs. During this time her life is important for the perpetuation of the race, and therefore, she is endowed with a sober costume, less likely to attract the eye of the passing enemy. The under surfaces of the wings of most butterflies are less gaudy than the upper surface, and, when raised perpendicularly over the back, closely mimic the object which they habitually rest. There are some Malay and Indian butterflies which, when on the wing, are so gay that they are at once conspicuous, but invisible the moment they alight, the under surface of their wings looking exactly like half-withered leaves, the insect so disposing of the rest of its body that it appears as if shrivelled up. Others, "covered with the fatal gift of beauty," are endowed with such a gorgeous tinge that birds leave them alone, not infrequently been described as such. Mr. WALLACE explains this on the principle of the female being generally slower in flight, and requiring several days to deposit her eggs. During this time her life is important for the perpetuation of the race, and therefore, she is endowed with a sober costume, less likely to attract the eye of the passing enemy. The under surfaces of the wings of most butterflies are less gaudy than the upper surface, and, when raised perpendicularly over the back, closely mimic the object which they habitually rest. There are some Malay and Indian butterflies which, when on the wing, are so gay that they are at once conspicuous, but invisible the moment they alight, the under surface of their wings looking exactly like half-withered leaves, the insect so disposing of the rest of its body that it appears as if shrivelled up. Others, "covered with the fatal gift of beauty," are endowed with such a gorgeous tinge that birds leave them alone, not infrequently been described as such.

THE DAILY TELEGRAPH.  
THURSDAY, OCTOBER 18, 1888.

EXHIBITION OF BUTTERFLIES.

Last evening the South London Entomological and Natural History Society opened its annual exhibition at the Bridge House Hotel, London Bridge, the locality which was established sixteen years ago, has for its aim the diffusion of biological science and the formation of typical collections; and, although its name would suggest that its membership or area of investigation, is confined to the Southern part of the metropolis, its scope is in point of fact, cosmopolitan. Originally founded in South London in 1872, its promoters have not hesitated to harmonise its title with its developed objects. The number of members has gradually increased (in spite of many changes through which the society appears to have passed), until the present time, when the roll records the names of about 150 persons in all parts of the country who take an active interest in the innumerable varieties of insect, botanical, and ornithological life. To the uninitiated and the collector alike the exhibition must be of considerable interest, including as it does not only objects whose beauty can be appreciated at a glance, but thousands of minute specimens the delicate structure and tints of which remain unrevealed without the aid of powerful microscopes. Insects of every variety of size and colour occupy the principal space, and are to be numbered by thousands. Lepidoptera familiar and lepidoptera rare may be seen arranged with excellent taste and marvellous care, and to the amateur exhibitors especially much credit is due. Mr. R. ALLEN has lent an admirable collection. Birds, fish, reptiles, and insects of many kinds are shown by Messrs. B. W. ALLEN, A. E. COPE, E. COOKE, W. E. DAVES, W. TURPIN, and Dr. SEQUIER, while in the geological branch an interesting case of rocks and fossils illustrating the formations of the South-East of England is exhibited by Mr. T. LEIGHTON. By the lady visitors especially Mr. W. Manger's display of corals and sponges was much admired. Nocturnal eastern moths have been noticed astonished at the surprising show of edible and inedible insects, and not a little awestruck to a sense of the risks run by the very slight difference to be observed between the innocuous and the harmful growing. This collection was made by Messrs. Carrington and Stip yesterday and is, and is completely correct, a large table. Among the other articles of interest to be seen are birds eggs and nests, molluscs, and numerous drawings, paintings, and photographs. In the course of the last evening lectures were delivered by Mr. W. L. MAY upon "The Wonders of Minute Vegetable and Animal Life," and "Curious Homes and queer Tenants," both being illustrated by the aid of the oxy-hydrogen microscope. Musical selections were also given at intervals by Mr. W. AUGUSTUS DOLTON. The exhibition will remain open this evening.

THE CITY PRESS,  
SATURDAY, OCTOBER 20, 1888

**SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.**

On Wednesday evening last, at the Bridge House Hotel, London Bridge, this society opened its annual exhibition. The society, which was established some fifteen years ago, has for its object the diffusion of biological science, by means of papers and discussions, and the formation of typical collections. To describe here the beautiful collections of insects, some of which were really only visible by the aid of microscopes, would be out of the question altogether, they being so numerous. Butterflies and moths in every variety of size and colour occupied the principal space, and were to be numbered by thousands. The collection of eggs, numbering also some thousands, were very interesting to behold. Birds, fish, and reptiles of many kinds were exhibited by Mr. ALLEN, Mr. COPE, Mr. DAVES, Mr. TURPIN, and Dr. SEQUIER; while in the geological branch an interesting case of rocks and fossils, illustrating the formations of the south-east of England was shown by Mr. T. LEIGHTON. In the course of the evening lectures were delivered by Mr. W. L. MAY, upon "The Wonders of Minute Vegetable and Animal Life," and "Curious Homes and queer Tenants," which were listened to with great interest. The exhibition was on view on the evenings of Wednesday and Thursday.

APPENDIX D

THE SOUTH LONDON  
ENTOMOLOGICAL AND NATURAL HISTORY  
SOCIETY.

EXHIBITION  
AT THE  
ST. MARTIN'S TOWN HALL  
(OPPOSITE ST. MARTIN'S CHURCH, TRAFALGAR SQUARE).  
ON THURSDAY, OCTOBER 17, 1895,  
FROM 7 P.M. TO 10.30 P.M.

THE EXHIBITS WILL INCLUDE  
BRITISH & FOREIGN INSECTS,  
MICROSCOPES,  
EGGS, BIRDS, REPTILES, SHELLS, FUNGI,  
MINERALS, AND BOTANICAL  
AND OTHER  
NATURAL HISTORY SPECIMENS  
ILLUSTRATED  
LECTURES  
WILL BE GIVEN BY  
MR. F. ENOCK & OTHERS

TICKETS FOR ADMISSION, ONE SHILLING EACH,  
and all other information may be obtained at the hall on the day, and of the SECRETARY,  
MR. STANLEY EDWARDS, Kidbrooke Lodge, Blackheath, S.E.

APPENDIX C

THE SOUTH LONDON  
Entomological and Natural History  
SOCIETY'S  
ANNUAL EXHIBITION,  
AT  
THE BRIDGE HOUSE HOTEL,  
15th and 16th April, 1891.

THIS Society has for its object the diffusion of Biological Science, by means of Papers and Discussions, and the formation of typical collections. There is a Library for the use of Members. Meetings are held on the Second and Fourth Thursday Evening in each month, from Eight to Ten p.m., at the Society's Rooms, which are easy of access from all parts of London, and the Council cordially invite the co-operation of all naturalists, especially those who are desirous to further the objects of the Society by reading papers and exhibiting their specimens.

Secretaries,  
HIBERNIA CHAMBERS, LONDON BRIDGE, S.E.

Exhibitors,  
T. R. BELLIPS, F.E.S.,  
C. A. BRIGGS, F.E.S.,  
J. T. CARRINGTON, F.E.S.,  
W. H. FUGGELL, Ph.C.,  
R. ALPIN, Ph.D.,  
R. SOUTH, F.E.S.,  
D. J. RICE.

Honorary Secretary,  
H. W. BARKER, F.E.S., 83, Brazard's Road,  
Peckham, S.E.



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## MEETINGS OF THE SOCIETY

are held regularly at the Society's Rooms, and include the well-known ANNUAL EXHIBITION, which takes place in October. Frequent Field Meetings are held at week-ends in the Summer. Visitors are welcome at all meetings. The current Programme Card can be had on application to the Secretary.

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# PROCEEDINGS AND TRANSACTIONS

OF

## THE SOUTH LONDON Entomological and Natural History Society.

World List abbreviation : *Proc. S. Lond. ent. nat. Hist. Soc.*

1954-55.



WITH SEVENTEEN PLATES (One Coloured)  
and THIRTY-NINE TEXT FIGURES

PUBLISHED AT THE SOCIETY'S ROOMS,  
14 ROCHESTER ROW - - - LONDON, S.W.1

MAY

1956

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# The South London Entomological and Natural History Society.

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S. N. A. JACOBS, S.B.St.J., F.R.E.S., and W. RAIT-SMITH, F.Z.S.,  
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## Session 1955-56.

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*Field Meetings:* S. WAKELY, 26, Finson Road, Ruskin Park,  
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*Assistant Curator—*R. D. WEAL.

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PROCEEDINGS AND TRANSACTIONS  
OF  
THE SOUTH LONDON  
Entomological and Natural History Society

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NOTE.—The Society is indebted to Mr. S. Gordon Smith for Plates IV and V and to Mr. F. T. Vallins for Plates VII and VIII.

# THE SOUTH LONDON Entomological and Natural History Society

14 ROCHESTER ROW, LONDON, S.W. 1

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## OBJECTS

The Society has for its objects the promotion and advancement of research in Biological Science, and its diffusion by means of meetings at the Society's Rooms for the reading of original papers, discussions and lectures, by public exhibitions, by field meetings, by the issue of publications, the formation of typical collections and of a library, and by such other means as the Council may from time to time determine.

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## MEETINGS

Indoor Meetings at Rochester Row are generally held twice monthly, on second and fourth Thursdays, at 6.30 p.m. Field Meetings take place throughout the Summer.

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## SUBSCRIPTIONS

Entrance Fee, 7/6. Ordinary Members, £1 11/6 (£1 1/- for members under 21) p.a.; Country Members, £1 1/- (12/6 for members under 21) p.a. Life Membership, Twenty Guineas.

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The Council invites the co-operation of all Naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting specimens.

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## COLLECTIONS, etc.

The Society possesses representative collections of most orders of insects, and an extensive library. These are available at all Ordinary Meetings. Members may borrow books at meetings or by post. Donations of suitable insects and books are much appreciated.

There is also a big collection of lantern slides, mainly of insects in all stages, from which series may be borrowed. Microscopes are available for home use.

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## COMMUNICATIONS

Should be addressed to the Hon. Secretary, F. T. VALLINS, A.C.I.I., F.R.E.S., 4, Tattenham Grove, Tattenham Corner, Epsom, Surrey.

## INSTRUCTIONS TO EXHIBITORS

(These apply to *all* meetings, not only to the Annual Exhibition.)

Attention to the following points will greatly add to the scientific value of the exhibits and our Proceedings, besides assisting the Publication Committee in preparing the reports for publication, a task which, in the past, has involved a quite unjustifiable amount of labour and time.

### LABELLING OF EXHIBITS.

Adequate labelling of all exhibits is essential; such labelling to include—

- (a) *name and address of exhibitor,*
- (b) *order and name* (generic and specific, with author) *of each species,*
- (c) *locality* (at least County or Country), or, in the case of bred specimens, the place of origin,
- (d) *date* (at least the month and year) of capture or breeding (or, in the case of a series, first and last dates),
- (e) *any other information of scientific interest, such as* "Gynandromorph", etc., relating to any particular specimen,

### REPORT FOR PROCEEDINGS.

A report, including all the points mentioned above for labelling, and amplified to give short details of any special aberrations, gynandromorphs (e.g. left side male, right side female), or other points of interest, *must be handed to the Recorder when the exhibit is taken in (at the Annual Exhibition) or to the Editor (at Ordinary Meetings).*

*Such report must be written or typed (preferably typed) ON ONE SIDE OF THE PAPER ONLY, WITH A 2 INCH MARGIN ON THE LEFT SIDE, WITH AT LEAST DOUBLE SPACING BETWEEN LINES, in the form used for the record in the Proceedings.*

Where the author of a specific name is not known, a blank space should be left for its insertion, but every endeavour should be made to furnish this in the first instance, to avoid misunderstandings.

## INSTRUCTIONS TO SPEAKERS

Speakers wishing to submit papers for publication, after reading, should give them to the Editor at the end of the meeting or send them to him as soon as possible afterwards, for consideration by the Publication Committee of the Society.

Naturally, not *all* the papers read or talks given to the Society are suitable for publication in the Transactions of the Society, and the Council, acting through the Publications Committee, reserves the right to refuse those papers it considers unsuitable.

The relevant Bye-law (26) (d) states that "all papers read or announced at any meeting and accepted for publication in the Society's publications shall become the property of the Society, unless otherwise stipulated before the reading or announcement thereof".

The Society will be very pleased to receive papers for consideration that may be suitable for reading in title. These should be sent to the Editor.

## PAST PRESIDENTS

1872-4	J. R. WELLMAN (dec.).	1923-4	N. D. RILEY, F.Z.S., F.E.S.
1875-6	A. B. FARN, F.E.S. (dec.).	1925-6	T. H. L. GROSVENOR, F.E.S. (dec.).
1877	J. P. BARRETT, F.E.S. (dec.).	1927-8	E. A. COCKAYNE, D.M., F.R.C.P. F.E.S.
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1880	A. FICKLIN (dec.).	1930	C. N. HAWKINS, F.E.S.
1881	V. R. PERKINS, F.E.S. (dec.).	1931	K. G. BLAIR, B.Sc., F.Z.S., F.E.S. (dec.).
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1883	J. R. WELLMAN (dec.).	1933	C. G. M. DE WORMS, M.A., Ph.D., A.I.C., F.R.E.S., M.B.O.U.
1884	W. WEST, L.D.S. (dec.).	1934	T. R. EAGLES.
1885	R. SOUTH, F.E.S. (dec.).	1935	E. E. SYMS, F.R.E.S.
1886-7	R. ADKIN, F.E.S. (dec.).	1936	M. NIBLETT.
1888-9	T. R. BILLUPS, F.E.S. (dec.).	1937	F. J. COULSON.
1890	J. T. CARRINGTON, F.L.S. (dec.).	1938	F. STANLEY-SMITH, F.R.E.S.
1891	W. H. TUGWELL, Ph.C. (dec.).	1939	H. B. WILLIAMS, LL.D., F.R.E.S.
1892	C. G. BARRETT, F.E.S. (dec.).	1940	E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.
1893	J. J. WEIR, F.L.S., etc. (dec.).	1941	F. D. COOTE, F.R.E.S. (dec.).
1894	E. STEP, F.L.S. (dec.).	1942	S. WAKELY.
1895	T. W. HALL, F.E.S. (dec.).	1943	R. J. BURTON, L.D.S., R.C.S.Eng.
1896	R. SOUTH, F.E.S. (dec.).	1944	STANLEY N. A. JACOBS.
1897	R. ADKIN, F.E.S. (dec.).	1945-46	Capt. R. A. JACKSON, R.N., F.R.E.S.
1898	J. W. TUTT, F.E.S. (dec.).	1947	L. T. FORD, B.A.
1899	A. HARRISON, F.L.S. (dec.).	1948	Col. P. A. CARDEW (dec.).
1900	W. J. LUCAS, B.A., F.E.S. (dec.).	1949	J. O. T. HOWARD, M.A.
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1902	F. NOAD CLARK (dec.).	1951	T. G. HOWARTH, B.E.M., F.R.E.S., F.Z.S.
1903	E. STEP, F.L.S. (dec.).	1952	E. W. CLASSEY, F.R.E.S.
1904	A. SICH, F.E.S. (dec.).	1953	F. STANLEY-SMITH, F.R.E.S.
1905	H. MAIN, B.Sc., F.E.S. (dec.).	1954	STANLEY N. A. JACOBS, S.B.St.J., F.R.E.S.
1906-7	R. ADKIN, F.E.S. (dec.).		
1908-9	A. SICH, F.E.S. (dec.).		
1910-11	W. J. KAYE, F.E.S.		
1912-13	A. E. TONGE, F.E.S. (dec.).		
1914-15	B. H. SMITH, B.A., F.E.S. (dec.).		
1916-17	HY. J. TURNER, F.E.S. (dec.).		
1918-19	STANLEY EDWARDS, F.L.S., etc. (dec.).		
1920-21	K. G. BLAIR, B.Sc., F.E.S. (dec.).		
1922	E. J. BUNNETT, M.A. (dec.).		

## LIST OF MEMBERS

(Revised to 10th July 1955)

Chief subjects of Study:—*b*, Botany; *bi*, Biology; *c*, Coleoptera; *cr*, Crustacea; *d*, Diptera; *ec. ent*, Economic Entomology; *ent*, Entomology, General; *e*, Exotic; *g*, Genetics; *hem*, Hemiptera; *hym*, Hymenoptera; *l*, Lepidoptera; *mi*, Microscopy; *ml*, Micro-lepidoptera; *mo*, Mollusca; *n*, Neuroptera; *nat. hist*, Natural History; *nat. phot*, Nature Photography; *od*, Odonata; *oo*, Oology; *orn*, Ornithology; *orth*, Orthoptera; *r*, Reptiles; *rh*, Rhopalocera; *t*, Trichoptera; *z*, Zoology.

## HONORARY MEMBERS.

Including Honorary Members appointed under Bye-law 10(a), (Hon.); and Special Life Members appointed under Bye-law 10(b), (S.L.).

DATE OF APPOINT- MENT.	DATE OF JOINING SOCIETY.	CLASS.	NAME, ADDRESS AND INTERESTS.
8.11.1950.	14. 1.1915.	Hon.	COCKAYNE, E. A., O.B.E., D.M., F.R.C.P., F.R.E.S., 8, High Street, Tring, Herts. <i>l, g</i> .
10. 1.1951.	10. 1.1951.	Hon.	GIFFORD, WALTER S., R.F.D., No. 2, Greenwich, Connecticut, U.S.A. <i>l</i> .
1. 1.1950.	12.10.1899.	S.L.	CARR, Rev. F. M. B., M.A., L.TH., Martin's Close, Mudeford, Christchurch, Hants. <i>l, n</i> .
1. 1.1951.	25. 1.1900.	S.L.	DAY, F. H., F.R.E.S., Blackwell Lodge West, Carlisle, Cumberland. <i>l, c</i> .
1. 1.1953.	1902.	S.L.	HARE, E. J., C.B.E., F.R.E.S., Harrow Place, Pinden, Dartford, Kent. <i>l</i> .

## LIFE, ORDINARY, AND COUNTRY MEMBERS.

YEAR OF  
ELECTION.

1951	ALLAN, P. B. M., M.B.E., M.A., F.S.A., F.R.E.S., F.Z.S., No. 4, Windhill, Bishop's Stortford, Herts. <i>l</i> .
1950	ALLEN, Miss D. M., "Cedars," Furzedown College, Welham Road, Tooting, London, S.W.17. <i>nat. hist</i> .
1943	ALLEN, DONALD, F.R.P.S., F.R.S.A., F.R.E.S., 698, Warwick Road, Solihull, Warwickshire. <i>hym, ent, l, nat. phot, mi</i> .
1951	ALLEN, Rev. P. V. M., 78, Conway Crescent, Perivale Park, Greenford, Middx. <i>l</i> .
1953	ASAHINA, S., D.SC., Totsuka 3-chome, 123, Shinjuku-ku, Tokyo, Japan. <i>od</i> .
1953	ASHBY, G. J., F.R.E.S., c/o Zoological Society of London, Regent's Park, London, N.W.8. <i>ent</i> .



## ELECTION.

- 1950 ASHWELL, D. A., The Heights, Galloway Road, Bishop's Stortford, Herts. *g, od, hym, nat. phot.*
- 1946 ASTBURY, C. F., 21, Warwick Gardens, West Kensington, London, W.14. *l.*
- 1950 ATHERLEY, Miss M., 43, Farley Road, Derby. *l.*
- 1934 ATKINSON, J. L., No. 2, Gatcombe House, Littlehempston, Nr. Totnes, Devon. *l.*
- 1954 ATTY, DAVID B., M.A., 18, Punchbowl Lane, Dorking, Surrey. *c.*
- 1952 BAILEY, KARL E. J., 73, Botley Road, Oxford. *l.*
- 1952 BAKER, B. R., 2, St. Saviour's Terrace, Field Road, Reading. *l.*
- 1939 BAKER, Capt. D. B., R.A.O.C., F.R.E.S., c/o 7, Tabor Court, Cheam, Surrey. *l, c.*
- 1953 BAKER, J. A., B.A., The Old Vicarage, Churt, Surrey. *l.*
- 1947 BALFOUR-BROWNE, Prof., W. A. F., M.A., F.R.S.E., F.R.E.S., F.L.S., Brocklehurst, Collin, Dumfries. *c.*
- 1942 BANNER, JOHN V., M.R.C.S., L.R.C.P., F.R.E.S., "Wykehurst," 41, Varndean Gardens, Brighton 6, Sussex. *l.*
- 1953 BARTON, Major B. C., O.B.E., Castle Mead, Highcliffe, Christchurch, Hants. *l.*
- 1948 BAXTER, L. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1948 BAXTER, R. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1933 BAYNES, E. S. A., O.B.E., F.R.E.S., 2, Arkendale Road, Glengary, Co. Dublin, Eire. *l.*
- 1954 BEARD, J. W., 15, Clarence Square, Brighton, Sussex. *ent.*
- 1954 BEAUFOY, S., B.SC.(ENG.), A.M.I.E.E., F.R.P.S., F.R.E.S., 98, Tuddenham Road, Ipswich, Suffolk. *ent.*
- 1938 BEIRNE, B. P., PH.D., F.R.E.S., F.L.S., Division of Entomology, Science Service Building, Ottawa, Ontario, Canada. *ml.*
- 1949 BELL, C. L., F.R.E.S., 23, Harcourt Road, Redland, Bristol 6. *l.*
- 1947 BEST, A. A., 131, Woodham Lane, New Haw, Weybridge, Surrey. *l.*
- 1949 BIRKETT, NEVILLE L., M.A., M.B., B.CHIR. (CANTAB.), 3, Thorny Hills, Kendal, Westmorland. *l, c, d.*
- 1945 BLASDALE, PHILIP, 10, Quarry Hill Road, Ilkeston, Derby. *ent.*
- 1949 BLATHWAYT, C. S. H., M.A. (OXON), F.R.E.S., "Amalfi," 27, South Road, Weston-super-Mare, Somerset. *l.*
- 1948 BLAXILL, A. D., "St. Marthas," Braiswick, Colchester, Essex. *l.*
- 1942 BLEST, T., "Homestead," Higham Lane, Tonbridge, Kent. *l.*
- 1926 BLISS, A., "Golden Mist," Whitford, near Axminster, Devon. *l.*
- 1925 BLYTH, S. F. P., 6, Hatherley Road, Winchester, Hants. *l.*
- 1948 BOLINGBROKE AND ST. JOHN, THE VISCOUNTESS (née FROHAWK, Valezina), Essendene, Cavendish Road, Sutton, Surrey. *nat. hist, ent.*
- 1948 BOLTON, E. L., Lyncombe, Stagbury Avenue, Chipstead, Surrey. *l.*

## ELECTION.

- 1948 BOWATER, Lt.-Col. W., M.C., B.D.S., T.D., D.L., 41, Calthorpe Road, Edgbaston, Birmingham, 15. *l, heredity.*
- 1944 BOWDEN, S. R., B.SC., A.R.C.S., F.R.E.S., 53, Crouch Hall Lane, Redbourn, Herts. *l, g.*
- 1946 BOWSER, E. W., J.P., Tytton Hall, Boston, Lincs. *l.*
- 1946 BOYCE, B., 16, Highland Road, Chichester, Sussex. *l.*
- 1948 BOYES, J. D. C., B.SC., A.R.I.C., A.R.P.S., Wimborne, Millfields, Nantwich, Cheshire. *l.*
- 1946 BRADLEY, J. D., F.R.E.S., 157, South Park Road, Wimbledon, London, S.W.19. *l.*
- 1947 BRETHERTON, R. F., C.B., M.A., F.R.E.S., Ottershaw Cottage, Ottershaw, Surrey. *l.*
- 1933 BRETT, G. A., B.SC., A.R.C.S., D.I.C., F.R.E.S., 2, Claygate Lane, Hinchley Wood, Esher, Surrey. *ent.*
- 1952 BRINDLE, ALLAN, F.R.E.S., 86, Princess Street, Nelson, Lancs. *ent.*
- 1940 BRITTEN, H., M.M., F.R.H.S., F.INST.P.A., "Newholme," 21, Toller's Lane, Old Coulsdon, Surrey. *ent (Chalcididae).*
- 1930 BROOKE, Miss W. M. A., F.L.S., 300, Philip Lane, London, N.15. *ec. ent, b, marine life.*
- 1954 BROWN, F. C., F.Z.S., 6, Osmond Gardens, Wallington, Surrey. *Giant Silk Moths.*
- 1943 BROWN, S. C. S., L.D.S., R.C.S.ENG., H.D.D.EDIN., 142, Richmond Park Road, Bournemouth, Hants. *ml, hym.*
- 1952 BRUSH, H. J., "Larkspur", West Farm Close, Ashted, Surrey. *ent.*
- 1952 BRYCE, D., The Bungalow, Cliffe, Gt. Harwood, Blackburn, Lancs. *l, dip.*
- 1936 BUCK, F. D., *President*, 36, Besant Court, Newington Green Road, London, N.1. *c.*
- 1955 BUCKLER, H. A., Sutton Bassett, Market Harborough, Leics. *l, ml*
- 1927 BULL, G. V., B.A., M.B., "White Gables" Sandhurst, Kent. *l.*
- 1946 BURKHARDT, Col. V. R., late R.A., D.S.O., O.B.E., 86, Main Street, Stanley, Hong Kong. *l.*
- 1944 BURNS, B. S., 1, Jamaica Villas, Stoke Road, Gosport, Hants. *l.*
- 1948 BURTON, P. J., L.D.S., R.C.S.ENG., F.R.E.S., "Paysanne," Godshill-wood, near Fordingbridge, Hants. *l.*
- 1938 BURTON, R. J., L.D.S., R.C.S.ENG., Cosey Dene, Blackminster, Evesham, Worcs. *l.*
- 1947 BUSBRIDGE, W. E., Firwood, 4, Mount Harry Road, Sevenoaks, Kent. *l.*
- 1922 BUSHBY, L. C., F.R.E.S., c/o Zoological Society of London, Regent's Park, London, N.W.8. *c, hem.*
- 1953 BUTTERFIELD, A. W., 124, Ashville Road, Leytonstone, London, E.11. *l.*
- 1951 BYERS, F. W., 59, Gurney Court Road, St. Albans, Herts. *l.*
- 1953 CADBURY, Mrs. BETTY, 78, Oakley St., Chelsea, London, S.W.3. *l.*
- 1948 CALDERARA, P., A.M.I.E.E., "Stratton Lodge," 26, Manor Road, Barnet, Herts. *l, c.*

## ELECTION.

- 1945 CARLIER, STUART E. W., F.R.E.S., 6, Warwick Buildings, Warwick Road, Solihull, Warwickshire. *l, c.*
- 1950 CAROLSFELD-KRAUSE, A. G., Slotsherrens Have 97, (Kobenhavn)-Vanlose, Copenhagen, Denmark. *l.*
- 1946 CARTER, R. A., 60, West Street, Dorking, Surrey. *c.*
- 1946 CHALMERS-HUNT, J. M., F.R.E.S., 70, Chestnut Avenue, West Wickham, Kent. *l.*
- 1945 CHARLSON, S., 89, Market Street, Stalybridge, Cheshire. *l, ent, g.*
- 1952 CHEVALLIER, L. H. S., 95, Muswell Hill Road, London, N.10. *l.*
- 1952 CHRISTIE, J., 137, Gleneldon Road, Streatham, S.W.16. *d.*
- 1945 CHRISTIE, L., *Recorder*, 137, Gleneldon Road, Streatham, S.W.16. *ent.*
- 1954 CLARK, J., 7, Park Road, Bognor Regis, Sussex. *ent.*
- 1951 CLARKE, C. ASTLEY, M.D., F.R.C.P. (Lond.), High Close, Thorsway, Caldby, Cheshire. *l.*
- 1936 CLASSEY, E. W., F.R.E.S., *Council*, 22, Harlington Road East, Feltham, Middlesex. *l.*
- 1934 COLE, G. A., M.A., F.C.A., Highfield, Westhumble, Dorking, Surrey.
- 1953 COLERIDGE, W. L., Ess Hill, Ashburton Road, Newton Abbot, S. Devon. *ent, orn.*
- 1946 COLLIER, Major A. E., M.C., B.A., Lynher, Horsham Rd., Cranleigh, Surrey. *l.*
- 1935 COLLINS, R. J., F.R.E.S., Roslyn, Blackthorne Road, Gt. Bookham, Surrey. *l.*
- 1936 COOPER, B. A., B.SC., A.R.C.S., F.R.E.S., 27, Spilsby Road, Boston, Lincs. *c (Elateroidea), ecology, ec. ent, l, nat. phot. (Life Member).*
- 1923 CORK, C. H., 11, Redesdale Street, Chelsea, London, S.W.3. *l.*
- 1947 CORNELIUS, J. A., 29, Grangecliffe Gardens, South Norwood, London, S.E.25. *l.*
- 1922 COUCHMAN, L. E., F.R.E.S., 35, Browne Street, West Hobart, Tasmania. *l.*
- 1909 COULSON, F. J., "Burnigill", 24, Springfield Avenue, Merton Park, London, S.W.20. *c, hem, l.*
- 1918 COURT, T. H., F.R.G.S., "Oakleigh," Market Rasen, Lincoln.
- 1947 COX, W. A. A., 65, Bamford Road, Bromley, Kent. *ent.*
- 1950 COXEY, S., 203, Green Lane, Bolton, Lancs. *l.*
- 1953 COXON, G. F., Crosby, Drive Spur, Kingswood, Surrey. *ent, nat. hist.*
- 1934 CRASKE, J. C. B., F.R.E.S., 33, Hinchley Drive, Hinchley Wood, Esher, Surrey. *l.*
- 1937 CRASKE, R. M., 22, Edge Street, Campden Hill, London, W.8. *ent.*
- 1918 CRAUFURD, CLIFFORD, "Denny," Bishop's Stortford, Herts. *l.*
- 1933 CREWDSON, R. C. R., F.R.E.S., "The Grange," Delamere, Northwich, Cheshire. *l.*
- 1947 CRIPPS, C. H., M.A., Bulls Head Farm, Eakley Lanes, Stoke Goldington, Newport Pagnell, Bucks. *l, rh. (Life Member.)*

## ELECTION.

- 1949 CROSS, G. S. E., A.C.T.S.INC., 31, Avenue Road, Finchley, London, N.12. *l*.
- 1932 CROW, P. N., Ravensdale, Ockham Drive, Ockham Road, East Horsley, Surrey. *l*.
- 1950 CRUTTWELL, G. H. W., Old Ford House, Frome, Somerset. *ent*.
- 1954 CUE, P., "Lhasa," Malvern Road, Ashford, Kent. *ent*.
- 1947 CUNNINGHAM, D., M.A., 42, Rae Street, Dumfries. *l, flora*.
- 1950 CURL, B. J. A., 33, Fair Oak Road, Bishopstoke, Eastleigh, Hants. *l*.
- 1946 CURRIE, P. W. E., M.C., F.R.E.S., 102, Burdon Lane, Belmont, Sutton, Surrey. *hym, orth*.
- 1937 CURTIS, A. E., F.R.E.S., "The Cottage," Ifold Estate, Loxwood, Billingshurst, Sussex. *l*.
- 1946 CURTIS, W. PARKINSON, F.R.E.S., M.S.B.E., Ladywell Cottage, Tower Road, Branksome Park, Bournemouth, Hants. *l*.
- 1951 DALY, D. W., 3, Stonehill Mansions, London, S.W.16. *ent*.
- 1927 DANBY, G. C., "Sheringham," 31, Albion Road, Sutton, Surrey. *l*.
- 1945 DAVIDSON, A. R., 2, Foster Road, Formby, Liverpool. *l, c*.
- 1951 DAVIS, G. A. N., M.R.C.S., L.R.C.P., Holt Wood, Aylesford, Kent. *l*.
- 1933 DEMUTH, R. P., M.A., L.R.I.B.A., Hardwicke, Glos. *l*.
- 1930 DENVIL, H. G., F.Z.S., F.R.H.S., 4, Warwick Road, Coulsdon, Surrey. *l, c*.
- 1947 DEWICK, A. J., Curry Farm, Bradwell-on-Sea, Southminster, Essex. *l*.
- 1945 DIXON, C. H., Northbrook Farm, Micheldever, Hants. *ent*.
- 1921 DOLTON, H. L., 36, Chester Street, Oxford Road, Reading, Berks. *l*.
- 1936 DOUDNEY, S. P., "Thurne," 110, Foxley Lane, Purley, Surrey. *l*.
- 1930 DUDBRIDGE, B. J., B.A., c/o The Secretariat, Dar-es-Salaam, Tanganyika. *ent*.
- 1949 DUFFIELD, C. A. W., M.C., J.P., F.R.E.S., Pickersdane, Brook, near Ashford, Kent. *l, c, hem, homoptera*.
- 1946 DUNBAR, J. G., Royal Commission, Ancient and Historic Monuments (Scotland), 3, South Bridge, Edinburgh 1. *l*.
- 1950 DUNK, H. C., 24, Abbots View, Abbots Rise, Kings Langley, Herts. *l*.
- 1952 DYSON, R. C., N.D.H., F.R.E.S., 112, Hollingbury Park Avenue, Brighton 6, Sussex. *l*.
- 1927 EAGLES, T. R., *Hon. Editor and Hon. Librarian*, 32, Abbey Road, Enfield, Middlesex. *l, c*.
- 1937 EASTON, N. T., D.F.H., 60, Beech Lane, Earley, Nr. Reading, Berks. *l, g, nat. phot*.
- 1948 ECKFORD, EDWARD, "Oldfields," Pulford, near Wrexham, Denbigh. *l*.
- 1949 EDWARDS, F. H., Rockfield, Abbey Road, Worthing, Sussex. *l*.
- 1945 EDWARDS, G. GRAVELEY, Talbot Croft, St Albans, Herts. *l*.
- 1945 EDWARDS, R. C., Arlesley, Pilgrims' Way, Westerham, Kent. *ent*.

## ELECTION.

- 1941 EDWARDS, Rev. Canon T. G., M.A., F.Z.S., 93, Alleyn Park, Dulwich, London, S.E.21.
- 1933 ELGOOD, W. S., M.A., North Brink, Wisbech, Cambs. *l*.
- 1950 ELLIS, D. J., 24, Hillside Grove, Mill Hill, London, N.W.7. *l*.
- 1947 ELLIS, J. E., B.Sc., The Brambles, Lusted Hall Lane, Tatsfield, Nr. Westerham, Kent. *l, d*.
- 1951 ELLISON, ELDON F. D., Youl Grange, Link Road, Eastbourne, and Clifton College, Bristol. *l*.
- 1945 ELLISON, R. ELDON, F.R.E.S., Youl Grange, Link Road, Eastbourne. *l*.
- 1937 EMBRY, B., F.R.E.S., Brocks Ghyll, Newick, Sussex. *l*.
- 1932 ENNIS, L. H., F.C.A., Southery, Milbourne Lane, Esher, Surrey. *l*.
- 1947 EVANS, Miss E., c/o Royal Entomological Society of London, 41, Queen's Gate, London, S.W.7.
- 1945 EVANS, L. J., 73, Warren Hill Road, Birmingham 23. *l*.
- 1946 FAIRCLOUGH, R., "Blencathra," Deanoak Lane, Leigh, Surrey. *ent*.
- 1947 FARWELL, I. G., F.R.E.S., "Mayfield Villa," Portmore, Lymington, Hants. *l*.
- 1955 FEARNEHOUGH, T. D., A.MET., 13, Salisbury Road, Dronfield, Nr. Sheffield. *l*.
- 1947 FEILDEN, G. ST. CLAIR, B.M./N.L.B.G., London, W.C.1. *ent*.
- 1946 FERGUSON, L. F., L.D.S., R.C.S., "Harley House," Gloucester Road, Teddington, Middlesex. *c*.
- 1930 FERRIER, W. J., F.R.E.S., 86, Portnalls Road, Coulsdon, Surrey. *l*.
- 1940 FFENNELL, D. W. H., Martyr Worthy Place, Winchester, Hants. *l*.
- 1943 FORD, E. B., M.A., D.SC., F.R.S., F.R.E.S., The University Museum, Oxford. *ent, g*.
- 1920 FORD, L. T., B.A., 28, Park Hill Road, Bexley, Kent. *l*.
- 1939 FORSTER, H. W., 32, Park Mead, Harlow, Essex.
- 1915 FOSTER, T. B., "Downlands," 24, York Road, Selsdon, Surrey. *l*.
- 1948 FRASER, Lt.-Col. F. C., I.M.S.RETD., M.D., M.R.C.S., L.R.C.P., F.R.E.S., 55, Glenferness Avenue, Winton, Bournemouth, Hants. *od, n*.
- 1952 FRASER, R. A., The Foundry Cottage, Ramsbury, Wilts. *l, c*.
- 1948 FRAZER, J. F. D., B.M., B.CH., Stone House, Harbourland, Boxley, Maidstone, Kent. *l*.
- 1946 FRIEDLEIN, A. F. E., "Wirostal," 47, Rayleigh Road, Hutton, Essex. *l*.
- 1951 FROHAWK, Mrs. M. J., Essendene, Cavendish Road, Sutton, Surrey. *ent, nat. hist*.
- 1947 GARDNER, A. E., F.R.E.S., *Hon. Curator*, 29, Glenfield Road, Banstead, Surrey. *od, l*.
- 1952 GARLAND, W. A., 7, Wherwell Road, Guildford, Surrey. *rh*.
- 1954 GERARD, B. McC., 68, Fern Lane, Heston, Hounslow, Middx. *ent*.
- 1950 GENT, P. J., 3, Union Road, Wellingborough, Northants. *l*.
- 1950 GIBBINS, M. J., 10, Perryfield Road, Crawley, Sussex. *l*.

## ELECTION.

- 1930 GILLIAT, F. T., B.A., F.R.E.S., 25, Manor Rd., Folkestone, Kent. *l*.
- 1952 GILLMAN, Lt.-Col. H. C. R., M.B.E., R.A., Noads House, Tilshead, Wilts. *ent*.
- 1950 GOATER, B., 27, Hiltingbury Road, Chandlers Ford, Hants. *l*.
- 1936 GOODBAN, B. S., 99, Lime Grove, Eastcote, Ruislip, Middx. *l*.
- 1935 GOODLIFFE, F. D., M.A., Lord Wandsworth Agricultural College, Long Sutton, Basingstoke, Hants. *ec. ent*.
- 1942 GOODSON, A. L., 26, Park Road, Tring, Herts. *l*.
- 1926 GORDON, D. J., B.A., F.R.E.S., Table Office, House of Commons, London, S.W.1. *c, l*.
- 1949 GOULD, A. W., 49, Begbie Road, Blackheath, London, S.E.3. *c*.
- 1936 GOWING-SCOPES, E., F.R.E.S., "Oakhurst", Oakwood Road, Crofton, Orpington, Kent. *l*.
- 1924 GRANT, F. T., 45, Shepway Avenue, Maidstone, Kent. *l, c*.
- 1951 GREEN, J. A., 61, Brewery Road, Plumstead, London, S.E.18. *l*.
- 1950 GREENWOOD, K. C., M.B., CH.B., "Rydal," 1, Conyers Avenue, Birkdale, Southport, Lancs. *l, ml*.
- 1953 GRIFFITHS, G. C. D., 13, Woodlands Avenue, Finchley, London, N.3. *d (Agromyzidae)*
- 1950 GULLY, J. G., Howells Bank Farm, Ringmer, Sussex. *l*.
- 1955 GURDON, J. B., Furnell House, Frensham, Surrey. *l*.
- 1947 HAGGETT, G. M., F.R.E.S., 1, Torton Hill, Arundel, Sussex. *l, ent*.
- 1953 HALL, D. G., 34, Ellerton Road, Wandsworth Common, London, S.W.18. *c*.
- 1949 HALL, STEWART SCOTT, C.B., M.SC., F.R.A.E.S., Head of British Joint Services Mission (Technical Services), 1800K Street N.W., Washington, D.C.
- 1944 HAMMOND, H. E., F.R.E.S., 16, Elton Grove, Birmingham 27. *l, ent*.
- 1949 HANSON, S. M., F.R.E.S., 167, Gunnersbury Park, Ealing, London, W.5. *l (Life Member.)*
- 1948 HARBOTTLE, A. H. H., Kenwood, Valley Road, Bude, N. Cornwall. *l*.
- 1943 HARDS, C. H., F.R.E.S., 40, Riverdale Road, Plumstead, London, S.E.18. *l*.
- 1943 HARPER, Comdr. G. W., R.N., F.R.E.S., Neadaich, Newtonmore, Inverness-shire, Scotland. *l*.
- 1954 HARPER, M. W., Neadaich, Newtonmore, Inverness-shire, Scotland. *l, ent*.
- 1936 HARRIS, W. H. A., "Kemel," Oak Tree Close, Stanmore, Middlesex. *l*.
- 1951 HARRISON-GRAY, M., 16, Carlton House Terrace, London, S.W.1. *Saturniidae*.
- 1953 HARVEY, J. G., 109, Burton Road, London, S.W.1. *c*.
- 1924 HARWOOD, P., F.R.E.S., Wyrley, Colehill, Wimborne, Dorset. *l, c*.

- 1927 HAWGOOD, D. A., 2, Kingsmead Road, Tulse Hill, London, S.W.2. *l*.
- 1924 HAWKINS, C. N., F.R.E.S., 23, Wilton Crescent, Wimbledon, London, S.W.19. *l, c, g*.
- 1938 HAYNES, R. F., 29, Fairfield Drive, Dorking, Surrey. *l*.
- 1923 HAYWARD, Capt. K. J., F.R.E.S., F.Z.S., F.R.G.S., Instituto Miguel Lillo, Calle Miguel Lillo, 205, Tucuman, Republica Argentina. *l, orn, c*.
- 1954 HEATH, JOHN, F.R.E.S., c/o The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancs. *ml*.
- 1935 HEDGES, A. V., F.R.E.S., "Ballavale," Santon, Isle of Man. *l*.
- 1920 HEMMING, A. FRANCIS, C.M.G., C.B.E., F.Z.S., F.R.E.S., 28, Park Village East, Regents Park, London, N.W.1. *l*.
- 1924 HENDERSON, J. L., *Hon. Treasurer*, 6, Haydn Avenue, Purley, Surrey. *c*.
- 1951 HERBULOT, C., 31, Av. d'Eylau, Paris 16e, France. *l*.
- 1954 HERVEY, The Rev. Canon G. A. K., M.A.(OXON.), Great Salkeld Rectory, Penrith, Cumberland. *ent, orn, b*.
- 1945 HESLOP, Mrs E. A., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l. nat. hist.*
- 1931 HESLOP, I. R. P., M.A., F.R.E.S., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l, nat. hist.*
- 1946 HEWSON, F., F.R.E.S., 23, Thornhill Drive, Gaisby, Shipley, Yorks. *l, hym. parasitica*.
- 1948 HICKIN, N. E., PH.D., B.SC., F.R.E.S., Plummers, Bletchingley, Surrey. *t*.
- 1948 HILLABY, J. D., F.Z.S., F.R.E.S., 85, Cholmley Gardens, London, N.W.6. *ent*.
- 1952 HILLIARD, R. D., 54, Gyles Park, Stanmore, Middlesex. *l*.
- 1945 HINTON, H. E., PH.D., B.SC., F.R.E.S., Department of Zoology, Bristol University, Bristol, Glos.
- 1949 HOARE-WARD, J. W., Box's Farm, Horsted Keynes, Sussex. *l*.
- 1953 HODGKINSON, ALEXANDER, A.R.C.A., 12, Kitson Road, Barnes, London, S.W.13. *l*.
- 1943 HOLLEBONE, Comr. L. H. T., O.B.E., R.N., F.R.E.S., Mombasa Institute of Muslim Education, P.O. Private Bag, Mombasa, Kenya.
- 1950 HOLLOWAY, P. H., F.R.E.S., Warwick House, Fair Oak, Eastleigh, Hants. *l*.
- 1946 HOLROYD, GEORGE C., "Silver Birches," 8, Elmside, Onslow Village, Guildford, Surrey. *l*.
- 1950 HONEYBOURNE, T. J., F.R.E.S., "Laceys," 97, Birchwood Road, Wilmington, Dartford, Kent. *l*.
- 1945 HOWARD, A. P., 71, Gills Hill Lane, Radlett, Herts. *ent*.
- 1927 HOWARD, J. O. T., M.A., Wycherley, Deepdene Wood, Dorking, Surrey. *l*.

## ELECTION.

- 1953 HOWARTH, Mrs. HELEN, "Arrochar", Barnet Gate, Arkley, Herts. *l, b.*
- 1931 HOWARTH, T. G., B.E.M., F.R.E.S., F.Z.S., "Arrochar", Barnet Gate, Arkley, Herts. *l.*
- 1934 HUGGINS, H. C., F.R.E.S., 65, Eastwood Boulevard, Westcliff-on-Sea, Essex. *l, ent.*
- 1952 HUMPHREY, J. C., R.N., Woodside, Chiddingly, Lewes, Sussex. *c.*
- 1947 HUMPHREY, S. W., Pear Tree House, Roade, Northamptonshire. *l, rh. (Life Member.)*
- 1933 HUTCHINGS, H. R., 127, Chadacre Road, Stoneleigh, Surrey. *l.*
- 1950 HYDE, G. E., F.R.E.S., 20, Woodhouse Road, Doncaster, Yorks. *l, od.*
- 1953 HYDE, R. A., "Woodside," Reading Road, Finchampstead, Berks. *c.*
- 1950 HYDE-WYATT, B., 108, Lindsay Road, Worcester Park, Surrey. *od, c, l.*
- 1953 IVES, Major D. H., R.A., 9, St Michaels Road, Colchester, Essex. *l.*
- 1940 JACKSON, Capt. REGINALD A., C.B.E., R.N., F.R.E.S., Middle Farm House, Codford St. Mary, Warminster, Wilts. *ent, l.*
- 1923 JACOBS, S. N. A., S.B.ST.J., F.R.E.S., *Trustee and Vice-President*, "Ditchling," 54, Hayes Lane, Bromley, Kent. *ml, e.ml.*
- 1948 JANSON, D. B., 44, Great Russell Street, London, W.C.1. *ent. (Life Member).*
- 1928 JANSON, O. J., F.R.E.S., 15, Kingshill Crescent, St. Albans, Herts, or 46, Beresford Road, Hornsey, London, N.8. *ent.*
- 1925 JARVIS, C. MACKECHNIE, F.L.S., Sussex House, Parkside, Wimbledon. *c.*
- 1938 JARVIS, F. V. L., B.SC., "Corbière", 33, Greencourt Drive, Bognor Regis, Sussex. *l, g.*
- 1947 JAY, E. P., Surrey Cottage, Littlehampton, Sussex. *l.*
- 1951 JEFFERSON, T. W., 37, Riversdale Terrace, Sunderland, Co. Durham. *l.*
- 1948 JEFFS, G. A. T., Nunsholme, Nuns Corner, Grimsby, Lincs. *l, ent.*
- 1945 JOHNSON, Major-General G. F., C.B., C.B.E., D.S.O., Castlesteads, Brampton, Cumberland. *l, orn.*
- 1952 JOPSON, F. L., Langdale, Higherford, Nelson, Lancs. *l.*
- 1946 KEMP, J. K. C., 12, Nab Wood Crescent, Shipley, Nr. Bradford, Yorks. *l.*
- 1943 KERSHAW, Col. S. H., D.S.O., Alderman's Place, Aspley Heath, Bletchley, Bucks. *l.*
- 1928 KETTLEWELL, H. B. D., M.A., M.B., B.CHIR., M.R.C.S., L.R.C.P., F.R.E.S., Dept. of Zoology, University Museum, Oxford. *g, l.*
- 1952 KINDRED, A. D., 27, Richmond Avenue, Bedfont, Middlesex. *l.*
- 1933 KING, H., C.B.E., D.SC., F.R.S., "Birchwood," Brierley Avenue, West Parley, Dorset. *l, orn.*
- 1947 KLIMESCH, J., Donatusgasse 4, Linz-a-Donau, Austria. *ml.*



## ELECTION.

- 1944 KLOET, G. S., F.Z.S., F.R.E.S., 14, Hawthorne Lane, Wilmslow, Cheshire. *ent.*
- 1952 KNIGHT, F., 90, Mitford Road, Holloway, London, N.19. *l.*
- 1952 KUMMERER-NAEGELE, H., 13, Rue des Fleurs, Mulhouse, (Haut Rhin), France. *l.*
- 1951 LANE, A. W., 178, Ravenscroft Road, Beckenham, Kent. *c.*
- 1947 LANFEAR, A. H., "Highclere," 20, South Eastern Road, Ramsgate. Kent. *l.*
- 1945 LANG, R. M., A.C.A., 85, Cheam Road. E. Ewell, Surrey. *l.*
- 1951 LANGMAID, J. R., 9, Craneswater Park, Southsea, Portsmouth, Hants. *l.*
- 1941 LAST, H. R., F.R.E.S., 12, Winkworth Road, Banstead, Surrey. *c, l.*
- 1946 LATHAM, F. H., F.R.E.S., "The Elms," Mapleborough Green, Redditch, Worcs. *l.*
- 1927 LAWSON, H. B., "Churchmead," Pirbright, Surrey. *l.*
- 1952 LEECH, M. J., "The Spinney," Freshfield Road, Formby, Nr. Liverpool. *l, c.*
- 1914 LEEDS, H. A., 3, Beville, Wood Walton, Huntingdon. *l.*
- 1952 LEES, F. H., F.R.E.S., "The Gables," Maidencombe, Torquay. *l.*
- 1952 LEGROS, A. E., 155, Glenfarg Road, Catford, S.E.6. *hym., arachnidae.*
- 1948 LESTON, D., F.Z.S., F.R.E.S., 44, Abbey Road, London, N.W.8. *hem. (Life Member.)*
- 1947 LEWIS, E., F.R.E.S., 8, Parry Road, South Norwood, London, S.E.25. *c.*
- 1934 LINE, H. V., 11, Priory Avenue, Petts Wood, Orpington, Kent.
- 1951 LING, R. B., The Severells, Rectory Lane, Sidcup, Kent. *l.*
- 1933 LIPSCOMB, Brigadier C. G., Misterton, Somerset. *l.*
- 1937 LISNEY, A. A., M.A., M.B., F.R.E.S., "Dune Gate," Clarence Road, Dorchester, Dorset. *l.*
- 1948 LLEWELYN, MRS. J. R., B.SC. (HORT.), F.R.E.S., 38, Fernleigh Rise, Ditton, Maidstone, Kent. *ent.*
- 1948 LOCKINGTON, N. A., M.A., A.R.I.C., 23, Stonards Hill, Loughton, Essex. *ent.*
- 1948 LORIMER, R. I., 8, Southway, Totteridge, N.20. *l.*
- 1950 LOVELL, R., 27, Athenaeum Road, Whetstone, London, N.20. *l.*
- 1954 LYON, F. H., M.B.E., F.R.E.S., Green Headland, Sampford Peverell, Tiverton, Devon. *l.*
- 1953 McCLURE, A. M., Bowyers Court, Wisborough Green, Sussex. *l.*
- 1952 McCRAE, A. W. R., Oak Lawn, Gordon Avenue, Stanmore, Middlesex. *l.*
- 1950 McDERMOTT, Miss C. A., "The Dene," Borough Green, Kent. *rh.*
- 1952 MACKWORTH-PRAED, C. W., F.R.E.S., Castletop, Burley, Hants. *ent.*
- 1949 MACNICOL, D. A. B., M.B., CH.B., 52, St Albans Road, Edinburgh 9. *l. ml.*

- 1931 MACNULTY, B. J., PH.D., B.SC., F.R.I.C., Ministry of Supply Tropical Testing Establishment, Port Harcourt, Nigeria. *l*.
- 1949 MANLEY, G. E. L., Chalvington House, Nr. Hailsham, Sussex. *l*.
- 1945 MANLEY, Lt.-Col. W. B. L., F.R.E.S., *Vice-President*, Greenways, Shoreham Rd., Otford, Kent. *ent*.
- 1932 MARCON, Rev. J. N., Christ Church Vicarage, Seaside, Eastbourne, Sussex. *l*.
- 1930 MARSH, Capt. DUDLEY G., "White Gates", Wingham Rd., Littlebourne, Nr. Canterbury, Kent. *l*.
- 1950 MARTIN, E. L., 9, Devonshire Road, Harrow, Middlesex. *l, t*.
- 1922 MASSEE, A. M., O.B.E., D.SC., F.R.E.S., East Malling Research Station, Kent. *hem, c, acarina*.
- 1955 MATTHEWS, D. P. L., T.D., Flat 5, 51, Cadogan Place, London, S.W.1. *l*.
- 1947 MAXWELL, Sir REGINALD M., M.A., G.C.I.E., K.C.S.I., Barford House, St Mary Bourne, Andover, Hants. *ent*.
- 1951 MAY, J. T., Homeland, Beech, Alton, Hants. *l*.
- 1950 MAY, R. M., Berkely Lodge, Highfields, Ashted, Surrey. *l*.
- 1946 MELLOWS, CHARLES, Alliot House, The College, Bishop's Stortford, Herts. *l, hym*.
- 1952 MENZIES, I. S., "Eden Roc", Florida Road, Ferring-by-Sea, Sussex. *c, l, orth*.
- 1946 MERE, R. M., F.R.E.S., *Council*, Mill House, Chiddingfold, Surrey. *l*.
- 1951 MESSENGER, J. L., B.A., "Oakhill", Oatlands Drive, Weybridge, Surrey. *l*.
- 1951 MICHAELIS, H. N., 10, Didsbury Park, Didsbury, Manchester 20. *l*.
- 1945 MICHAUD, J., PH.D., 22, Routh Road, London, S.W.18. *ent*.
- 1938 MINNION, W. E., 40, Cannonbury Avenue, Pinner, Middlesex. *l*.
- 1952 MONTGOMERY, Major J. R. P., M.C., 17 Parachute Bn. (9D.L.I.) T.A., Burt Terrace Drill Hall, Gateshead, Co. Durham. *l*.
- 1946 MOORE, B. P., B.SC., PH.D., F.R.E.S., *Council*, "Montrose," Stoneyfields, Farnham, Surrey. *od, c*.
- 1947 MOORE, D. R., Sunnyside Cottage, Westcar Lane, Hersham, Surrey. *l (Life Member)*.
- 1947 MOPPETT, A. A., B.A., 39, Fairdale Gardens, Hayes, Middlesex. *ent*.
- 1951 MORE, D., The Little House, Hockley Road, Rayleigh, Essex. *ent*.
- 1949 MORGAN, H. D., F.R.E.S., 3, Ten Acre Wood, Margam, Port Talbot, Glam. *ent*.
- 1920 MORISON, G. D., B.SC., PH.D., F.R.E.S., Dept. Advisory Entomology, N. of Scotland Agricultural College, Marischal College, Aberdeen, Scotland. *ec. ent*.
- 1930 MORLEY, A. M., O.B.E., M.A., F.R.E.S., 9, Radnor Park West, Folkestone, Kent. *l*.
- 1953 MORRIS, M. G., F.R.E.S., "Old Timbers," 57, St. Mary's Avenue, Shortlands, Kent. *l*.

## ELECTION.

- 1951 MURGATROYD, J. H., F.L.S., F.R.E.S., F.Z.S., "Arachne", Warren Edge Road, Southbourne, Bournemouth, Hants. *arach.*
- 1945 MURRAY, Rev. D. P., F.R.E.S., The Lodge, Stoke Golding, Nr. Nuneaton, Warwick. *l.*
- 1949 NEWMAN, D. E., 4, Andrew Road, Wallingford, Berks. *l.*
- 1926-36 and 1945 NEWMAN, L. HUGH, F.R.E.S., Chestnut House, Cold Blow, Bexley, Kent. *l.*
- 1950 NEWTON, J., B.SC., 11, Oxlease Close, Tetbury, Glos. *l.*
- 1945 NEWTON, J. L., M.R.C.S., L.R.C.P., *Council*, H.M. Prison, Brixton, S.W.2. *l, b.*
- 1930 NIBLETT, M., F.R.E.S., 10, Greenway, Wallington, Surrey. *galls.*
- 1953 NISSEN, C. L., Flat 10, 250, South Norwood Hill, London, S.E.25. *l.*
- 1938 ODD, D. A., F.Z.S., F.R.E.S., Greenbank, Shepherds Hill, Buxted, Nr. Uckfield, Sussex. *l.*
- 1932 O'FARRELL, A. F., B.SC., A.R.C.S., F.R.E.S., New England University, Armidale, N.S.W., Australia. *od, cr, ent.*
- 1934 OLIVER, G. B., "Corydon," Amersham Road, Hazlemere, High Wycombe, Bucks. *l.*
- 1943 OLIVER, G. H. B., "Corydon," Amersham Road, Hazlemere, High Wycombe, Bucks. *l.*
- 1952 OLLEVANT, D., 3, Salcombe Drive, Morden, Surrey. *l, ml.*
- 1952 OLSEN, E. T., Hersegade 5, Roskilde, Denmark. *ml.*
- 1945 OWEN, GODFREY V., Orford, 63, Manor Park Road, West Wickham, Kent. *l.*
- 1951 OWERS, D. E., "Woodstock", Durfold Wood, Plaistow, Billingshurst, Sussex. *l, c, od.*
- 1942 PARFITT, R. W., 4, Brind Park Terrace, Sandhurst, Camberley, Surrey. *l.*
- 1946 PARMENTER, L., F.R.E.S., 94, Fairlands Avenue, Thornton Heath, Surrey. *d. (Life Member.)*
- 1948 PARRY, J. A., F.R.E.S., "Cavendish", North Holmes Road, Canterbury, Kent. *l, c.*
- 1949 PARSONS, R. E. R., F.R.E.S., I.P., Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. *l.*
- 1950 PAYNE, J. H., 10, Ranelagh Road, Wellingborough, Northants. *rh, breeding.*
- 1940 PAYNE, R. M., 8, Hill Top, Loughton, Essex. *c, od, orth, b. (Life Member.)*
- 1953 PEACEY, A. F., Hillside, Brimscombe, Stroud, Glos. *ml.*
- 1955 PEARSON, A. J. R., Dower Cottage, Feering, Colchester, Essex. *rh.*
- 1940 PELHAM-CLINTON, EDWARD C., F.R.E.S., 34, Craigmillar Park, Edinburgh, 9. *l.*
- 1928 PERKINS, J. F., B.SC., F.R.E.S., 95, Hare Lane, Claygate, Surrey. *hym.*
- 1944 PERRY, K. M. P., 15, Roundwood Way, Banstead, Surrey. *c.*
- 1950 PETERS, WALLACE, M.B., B.S., M.R.C.S., L.R.C.P., F.R.E.S., 175, Lauderdale Mansions, London, W.9. *ent, l.*

## ELECTION.

- 1953 PETERSEN, K., St. Albans, Upper West Street, Reigate, Surrey. *l*.
- 1946 PHELPS, C. C., M.B.E., 4, Queensberry House, Friars Lane, Richmond, Surrey. *l*.
- 1945 PHILPOTT, V. W., F.R.E.S., Rose Cottage, Watergate Lane, Broadmayne, Dorset. *l*.
- 1933 PINNIGER, E. B., F.R.E.S., "Littlecote", 19, Endlebury Road, Chingford, London, E.4. *od, n, l*.
- 1949 PLATTS, J. H., Green Shutters, Manthorpe Road, Grantham, Lincs. *l*.
- 1947 POLACEK, V. B., Brandys-nad-Labem, c.p. 601, 1 patro, Komen-skeho-ulice, Czechoslovakia. *b, ent, orn*.
- 1933-40, 1950 POOLES, S. W. P., 154, Thorpe Road, Peterborough, Northants. *l*.
- 1949 POPHAM, W. J., 89, Frederick Place, Plumstead, London, S.E.18. *l*.
- 1953 POUNCE, A. G., Laurel Villa, Meopham, Kent. *ent*.
- 1950 PRICE, G. C., "Alpha," 67, Cornyx Lane, Solihull, Warwickshire. *l*.
- 1948 PRICHARD, R., "Lincona," Woodcroft Lane, Bebington, Cheshire. *l, ml*.
- 1948 PRIDEAUX, A. G., B.A., Union Club, Carlton House Terrace, London, S.W.1. *ent (rh), orn*.
- 1945 PUREFOY, J. BAGWELL, c/o Upper Tilt Works, Cobham, Surrey. *l*.
- 1947 QUARRINGTON, C. A., A.M.BRIT.I.R.E., "Pennyfields," Bagshott Road, Chobham, Surrey.
- 1949 QUINNEY, L. G., 36, Mount Pleasant, Reading, Berks. *ent*.
- 1922 RAIT-SMITH, W., F.Z.S., F.R.E.S., F.R.H.S., *Trustee*, "Hurstleigh," Linkfield Lane, Redhill, Surrey. *l*.
- 1946 RANSOME, Major-General A. L., O.B., D.S.O., M.C., The Close, Braishfield, Romsey, Hants. *rh*.
- 1953 RAWLINGS, C. J., "Muristan", Berther Rd., Emerson Park, Hornchurch, Essex. *l*.
- 1946 RAY, H., Mill House Cottage, Bishopstoke, Hants. *rh*.
- 1952 REID, J. F., 19, High Street, Leighton Buzzard, Beds. *l*.
- 1950 REID, W., A.M.I.C.E., 6, Whirlow Park Road, Sheffield 11, Yorks. *ent*.
- 1953 RENFREW, C., F.R.I.C.S., F.A.I., Lanhill, Bourton-on-the-Water, Glos. *l*.
- 1952 RICHARDS, A. W., M.A., B.Sc., Nether Edge, Fox Lane, Farnborough, Hants. *od, orth, l, ml, Pyralidae*.
- 1945 RICHARDS, Prof. O. W., M.A., D.Sc., F.R.E.S., *Council*, Department of Zoology, Imperial College of Science and Technology, South Kensington, London, S.W.7. *ent*.
- 1948 RICHARDSON, A. E., 391, Malden Road, Worcester Park, Surrey. *l*.
- 1942 RICHARDSON, AUSTIN, M.A., F.R.E.S., Beaudesert Park, Minchinhampton, Glos. *l*.
- 1936 RICHARDSON, N. A., 11, Windsor Street, Bletchley, Bucks. *l*.
- 1908 RILEY, Capt. N. D., C.B.E., F.R.E.S., F.Z.S., 7, McKay Road, Wimbledon, London, S.W.20. *l*.

## ELECTION.

- 1953 RIORDAN, B. D., 75, Blenheim Road, North Harrow, Middlesex. *c.*
- 1953 RIVERS, C. F., 98, Windsor Road, Cambridge. *l* (*virus diseases of lep. larvae*).
- 1910 ROBERTSON, G. S., M.D., "Struan," Storrington, near Pulborough, Sussex. *l.*
- 1949 ROBINSON, H. S., F.R.E.S., Lower Farringdon, Alton, Hants. *l.*
- 1954 ROBINSON, P. J. M., B.Sc., A.M.I.C.E., Homestead, Sandy Down, Nr. Lymington, Hants. *l.*
- 1951 ROBSON, J. P., 10, Vane Road, Barnard Castle, Co. Durham. *l.*
- 1953 ROCHE, C. G., A.C.A., Talbot House, 42, Trinity Square, London, E.C.3. *hym.*
- 1942 ROCHE, P. J. L., M.R.C.S., L.R.C.P., F.R.E.S., c/o D.M.S., Lagos, Nigeria. *c, hem, e.l.*
- 1954 ROGERS, G. B., 70, Faraday St., Hull, Yorks. *c, l.*
- 1953 ROSE, IAN C., "Shrublands", Mistley, Essex. *ent.*
- 1932 RUDLAND, W. LEWIS, F.R.E.S., 452, Hythe Road, Ashford, Kent. *l.*
- 1947 RUMSEY, F., 46, Warren Road, Banstead, Surrey. *l.*
- 1949 RUNGE, C., 11, St. Andrews Road, Caversham, Reading, Berks. *l, hym.*
- 1952 RUSSWURM, A. D. A., F.R.E.S., 1, Langley Oaks Avenue, Sanderstead, Surrey. *l.*
- 1950 RYLE, G. B., DIP.FOR.(OXON.), "Caio," Alders Road, Reigate, Surrey. *Forest ent, hem.*
- 1946 SAUNDBY, Air-Marshel Sir ROBERT H. M. S., K.C.B., K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S., Oxleas, Burghclere, near Newbury, Berks. *l.*
- 1947 SAUNDERS, J. M. K., 27, Canonbury Avenue, Pinner, Middlesex. *l* (*especially rh*).
- 1945 SAUNT, J. W., A.L.S., "Riverview," Minerva Road, East Cowes, I.O.W. *hym, ent.*
- 1927 SCOTT, Col. E., D.S.O., M.D., S.B.ST.J., "Suomi," Westwell, Ashford, Kent. *l.*
- 1952 SCUDDER, G. G. E., B.Sc., F.R.E.S., 1, Eltham Cottages, Station Road, Longfield, Dartford, Kent. *hem.*
- 1948 SCULTHORP, A. H., 46, Pick Hill, Waltham Abbey, Essex. *c.*
- 1946 SELF, K. W., 53b, Earls Avenue, Folkestone, Kent. *ent.*
- 1923 SEVASTOPULO, D. G., F.R.E.S., c/o Ralli Bros., Ltd., P/O Box 401, Kampala, Uganda. *l.* (*Life Member.*)
- 1951 SHAW, R. G., 5, Barnham Road, Chingford, London, E.4. *l, hem.*
- 1947 SHORT, H. G., M.Sc., "Leaholme", 8, Milbourne Lane, Esher, Surrey. *l.*
- 1954 SHOWLER, A. J., M.Sc., 19, Harvel Crescent, Abbey Wood, London, S.E.2. *l.*
- 1948 SIGGS, L. W., 10, Repton Road, Orpington, Kent. *l.*
- 1939 SIVITER SMITH, P., F.R.E.S., 21, Melville Hall, Holly Road, Edgbaston, Birmingham, 16. *l.*

## ELECTION.

- 1948 SMALL, H. M., Armeria, Waterloo Lane, Skellingthorpe, Lincs.  
*l, od.*
- 1952 SMITH, A., 23, First Avenue, Heworth, York. *l, c.*
- 1954 SMITH, D. N. K., 35, Princes Ave., Woodford Green, Essex  
*l, Saturniidae.*
- 1953 SMITH, D. S., F.R.E.S., 87, Willingdon Road, Eastbourne,  
Sussex. *l.*
- 1941 SMITH, Lieut. FDK. WM., R.N.V.R., Woottons Cottage, Bucklebury  
Place, Woolhampton, Berks. *l, hym. (Life Member.)*
- 1920-25 and 1939 SMITH, S. GORDON, F.L.S., F.R.E.S., "Estyn," Bough-  
ton, Chester. *ent.*
- 1938 SNELL, B. B., F.R.E.S., "Woodsome," Bromborough, Cheshire. *l.*
- 1946 SOUTHWOOD, T. R. E., B.SC., A.R.C.S., F.R.E.S., Kingiton House,  
Old Perry St., Nr. Gravesend, Kent. *ent, hem, c, ecology.*
- 1949 SPENCER, K. A., B.A., F.R.E.S., 11, Christchurch Hill, London,  
N.W.3. *l, dip.*
- 1947 SPERRING, A. H., Slindon, Fifth Avenue, Warblington, Hants. *l.*
- 1950 SPITTLES, C. E., 95, Tring Road, Aylesbury, Bucks. *l.*
- 1943 SPREADBURY, W. H., Council, 35, Acacia Grove, New Malden,  
Surrey. *nat. hist.*
- 1920-32 and 1938 STAFFORD, A. E., "Corydonis," 83, Colborne Way,  
Worcester Park, Surrey. *l.*
- 1953 STALLWOOD, B. R., 19, Southfield Gardens, Strawberry Hill,  
Twickenham, Middlesex. *l.*
- 1949 STANLEY, F. C., F.R.E.S., "Swanmore," Bowes Hill, Rowlands  
Castle, Hants. *l, c.*
- 1927 STANLEY-SMITH, F., F.R.E.S., Council, "Hatch House", Pilgrims'  
Hatch, Brentwood, Essex. *l.*
- 1954 STANNERS, Comdr. L. S., R.N.Z. NAVY, "Westhanger Place,"  
Westbrook Road, Godalming, Surrey. *l.*
- 1937 STEDALL, H. P. P., Chiltern Manor, Great Missenden, Bucks. *ent.*
- 1938 STERLING, Major D. H., R.A.P.C. *l.*
- 1942 STIDSTON, Eng. Capt. S. T., R.N., F.R.E.S., "Ashe," Ashburton,  
Devon. *l.*
- 1952 STORACE, LUCIANO, Museo Storia Naturale, Via Brigata Liguria, 9,  
Genoa, Italy. *l.*
- 1924 STOREY, W. H., Fairstead, Long Road, Cambridge. *ent.*
- 1945 STOUGHTON-HARRIS, G., M.A., F.C.A., F.R.E.S., "Rosegarth," Wal-  
dens Road, Horsell, Woking, Surrey. *ent.*
- 1948 STRUTHERS, F. M., 143a, Gander Green Lane, Cheam, Surrey. *l.*
- 1929 STUBBS, G. O., Egremont House, Ely, Cambs., and Survey Office,  
Kuala Lumpur, Malaya.
- 1939 SUMMERS, E. J., 45, Mulgrave Road, Sutton, Surrey. *c, hem.*
- 1934 SUTTON, GRESHAM R., 6, Kenilworth Gardens, Loughton, Essex.  
*l, c.*
- 1950 SWAIN, H. D., M.A., F.R.E.S., 47, Dryburgh Road, Putney,  
S.W.15. *l, hy, c, hem.*
- 1950 SYMES, H., M.A. (OXON), 52, Lowther Road, Bournemouth, Hants. *l.*

## ELECTION.

- 1916 SYMS, E. E., F.R.E.S., F.Z.S., 22, Woodlands Avenue, Wanstead, London, E.11. *n, orth, od, t.*
- 1942 TALBOT DE MALAHIDE, THE LORD, 2, Devonshire Street, London, N.W.1. *l.*
- 1922-44 and 1952 TAMS, W. H. T., F.R.E.S., 20, Ranelagh Avenue, Fulham, London, S.W.6. *ent.*
- 1950 TAYLOR, A. S., 364, Burley Road, Leeds 4. *l.*
- 1941 TAYLOR, H. G. W., 11, Old Forge Way, Sidcup, Kent. *l.*
- 1934 TAYLOR, J. O., 64, Great Thrift, Petts Wood, Kent. *l.*
- 1925 TAYLOR, J. SNEYD, M.A., F.R.E.S., P.O. Box 597, Port Elizabeth, South Africa. *l.*
- 1949 TEMPLE, Miss VERE, F.R.E.S., King's Chase, Tollard Royal, Salisbury, Wilts. *l, hym, orth, od.*
- 1931 THOMPSON, J. ANTONY, M.A., Milton Lodge School Wells, Somerset. *l, g.*
- 1952 THORN, Miss B. A., "Paviott", 16, Springfields, Broxbourne, Herts. *l.*
- 1952 THORNTON, J., 43, Barnes Street, Clayton-le-Moors, Accrington, Lancs. *l.*
- 1946 THORPE, JOHN, F.R.E.S., Perrivale, Elmore Lane, Quedgeley, Glos. *l, c, b.*
- 1950 THORPE-YOUNG, D. W., A.I.A.C., F.Z.S., 11, Waverley Way, Carshalton Beeches, Surrey. *ent.*
- 1945 TIMMS, C., F.R.E.S., 524a, Moseley Road, Birmingham 12. *d.*
- 1953 TORLESSE, Rear Admiral A. D., C.B., D.S.O., The Cottage, 18, Bury Road, Alverstoke, Hants. *l.*
- 1948 TORSTENIUS, STIG, Celsiusgatan 7, Stockholm K, Sweden. *l.*
- 1950 TROUGHT, TREVOR, M.A., F.R.E.S., Brookland, Tysoe, Warwickshire. *l.*
- 1948 TRUNDELL, E. E. J., 6, Arragon Gardens, West Wickham, Kent. *ent, l.*
- 1948 TUBBS, Mrs M., 9, Lingfield Road, Wimbledon Common, S.W.19. *rh.*
- 1947 TUBBS, R. S., O.B.E., F.R.I.B.A., Council, 9, Lingfield Road, Wimbledon Common, S.W.19. *rh.*
- 1934 TUNSTALL, H. G., Council, 11, St. James Avenue, Ewell, Surrey. *l.*
- 1940 TURNER, A. D., 19, Manor Close, Kingsbury, London, N.W.9. *ent.*
- 1948 TURNER, A. H., F.Z.S., F.R.E.S., F.R.MET.S., Forest Drove, Bickenhall, Hatch Beauchamp, Taunton, Somerset. *ent, insect migration, conchology. (Life Member.)*
- 1944 TURNER, H. J., "Casita," 240, Iford Lane, Southbourne, Nr. Bournemouth, Hants. *l.*
- 1943 TURNER, J. FINCHAM, 20, Kenley Walk, N. Cheam, Surrey. *l, hym.*
- 1953 TWEEDIE, M. W. F., M.A., C.M.Z.S., Raffles Museum, Singapore 6, Malaya. *l.*
- 1952 UFFEN, R. W. J., 4, Vaughan Avenue, Stamford Brook, W.6. *l, hym, d.*
- 1945 VALENTINE, ARTHUR, 5, Vicars Close, Wells, Somerset. *ent.*



## ELECTION.

- 1922-24, 1937-41, 1947 VALLINS, F. T., A.C.I.I., F.R.E.S., *Hon. Secretary*, 4, Tattenham Grove, Tattenham Corner, Epsom, Surrey *Lycaenidae. (Life Member.)*
- 1951 VARLEY, Prof. G. C., M.A., PH.D., F.R.E.S., F.Z.S., Hope Dept. of Entomology, University Museum, Oxford. *hym, d.*
- 1951 VIETTE, P. E. L., Paris Museum (Entomology), 45 bis, R. de Buffon, Paris 5, France. *l.*
- 1949 WADE, D., 17, Waldegrave Avenue, Holderness Road, Hull, Yorks. *l, orn.*
- 1929-31 and 1944 WAINWRIGHT, CHARLES, B.SC., F.R.I.C., 42, St. Bernards Road, Olton, Warwickshire. *l.*
- 1911 WAKELY, Sir LEONARD D., K.C.I.E., C.B., 37, Marryat Road, Wimbledon, London, S.W. 19. *l.*
- 1947 WAKELY, L. J. D., O.B.E., M.A., Cottingley, Anderson Road, Madras. *l.*
- 1930 WAKELY, S., *Council*, 26, Finsen Road, Ruskin Park, London, S.E.5. *l.*
- 1951 WALKER, D. H., 90, Whytecliffe Road, Purley, Surrey. *l.*
- 1953 WALLIS, J. L. P., A.R.I.C.S., Kingswood Hotel, Gillingham, Kent. *ent, l.*
- 1935 WALLIS-NORTON, Capt. S. G., 2 Victoria Mansions, Eastbourne, Sussex. *ent. (Life Member.)*
- 1936 WARRIER, R. EVERETT, 99, Braidwood Road, London, S.E.6. *l.*
- 1939 WATKINS, N. A., M.A., F.R.E.S., Soldon, Druid Road, Stoke Bishop, Bristol 9, Glos. *l.*
- 1945 WATKINS, O. G., F.R.E.S., 20, Torr View Avenue, Peverell, Plymouth, Devon. *l, od.*
- 1920 WATSON, D., "Woodend," Lower Road, Fetcham, Leatherhead, Surrey. *l.*
- 1945 WATSON, R. W., F.R.E.S., 15, Halstead Road, Bitterne Park, Southampton, Hants. *l.*
- 1926-27, 1928-38, 1948 WATTS, W. J., F.R.E.S., 115, Leigham Court Drive, Leigh on Sea, Essex. *c.*
- 1947 WEAL, R. D., 124, Marmion Avenue, South Chingford, London, E.4. *c.*
- 1945 WEBB, HARRY E., F.R.E.S., *Lanternist*, 20, Audley Road, Hendon, London, N.W.4. *l.*
- 1945 WEDDELL, B. W., 13, The Halve, Trowbridge, Wilts. *ent.*
- 1911 WELLS, H. O., "St Hilary," 4, Boleyn Avenue, East Ewell, Surrey. *l.*
- 1953 WEST, B. B., 1, Pond Square, London, N.6. *l, od.*
- 1947 WEST, B. K., Branksea, 193, Shepherd's Lane, Dartford, Kent. *l.*
- 1945 WHEELER, A. S., "Courtside," 21, Shelveys Way, Tadworth, Surrey. *l.*
- 1948 WHICHER, L. S., F.R.E.S., A.I.A.E.E., 6, Chisholm Road, Richmond, Surrey. *c.*



## ELECTION.

- 1949 WHITE, Miss E. M. S., DIP. HORT. (READING), F.R.H.S., County Education Office, County Hall, Ipswich, Suffolk. *agric. ent, nat. hist.*
- 1954 WHITEHEAD, J., 16, Westbourne Arcade, Bournemouth, Hants. *l.*
- 1946 WHITEHORN, K. P., F.R.E.S., "Spindles", Windsor Road, Gravesend, Kent. *l.*
- 1953 WIFFEN, R. C. G., 12, Girdlers Road, London, W.14. *c.*
- 1920-30, 1955 WIGHTMAN, A. J., F.R.E.S., 67, The Spinney, Pulborough, Sussex. *l (noctuae)*
- 1946 WILD, E. H., 112, Foxearth Road, Selsdon, Surrey. *l.*
- 1946 WILDRIIDGE, W., "Flavion," Penn Road, Park Street, Nr. St Albans, Herts. *ent.*
- 1947 WILKINSON, W., 21, Highfield Avenue, Goldthorpe, Nr. Rotherham, Yorks. *l.*
- 1947 WILLIAMS, Mrs D. M., "Warley Lea," Brentwood, Essex. *l.*
- 1945 WILLIAMS, E. F., F.R.E.S., "Warley Lea," Brentwood, Essex. *l.*
- 1947 WILLIAMS, E. P., "Warley Lea," Brentwood, Essex. *l, od.*
- 1925 WILLIAMS, H. B., Q.C., LL.D., F.R.E.S., West Moushill, Milford, Nr. Godalming, Surrey. *l, g.*
- 1948 WILLIAMS, L. H., B.SC., 31, Armour Road, Tilehurst, Reading, Berks. *ent.*
- 1932 WILLIAMS, S. W. C., 17, Beresford Road, Chingford, London, E.4. *l.*
- 1951 WOOD, E. F., 18, Nursery Road, Prestwich, near Manchester, Lancs. *l.*
- 1927 WORMS, C. G. M. DE, M.A., PH.D., F.R.I.C., F.R.E.S., M.B.O.U., "Three Oaks", Shore's Road, Horsell, Woking, Surrey. *l, orn.*
- 1949 WRIGHTSON, A. L., 93, Morse Street, Lower Brunshaw, Burnley, Lancs. *l.*
- 1945 WYKES, N. G., Carter House, Eton College, Windsor, Berks. *l.*
- 1951 WYNN, R. A. W., 14, Nursery Avenue, Hale, near Altrincham, Cheshire. *ec. ent, hem.*
- 1945 YODEN, GEORGE H., F.R.E.S., 18, Castle Avenue, Dover, Kent. *l.*
- 1950 YOUNG, Miss G. M., 31, Turnfield Lane, London, N.8. *l.*
- 1952 YOUNG, L. D., 55, Ottways Lane, Ashted, Surrey. *ent.*

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Members will greatly oblige by informing the Hon. Secretary of any errors in, additions to, or alterations required in the above addresses and descriptions.

# Geographical List of Members arranged under Country, County and Town in Alphabetical Order

## ENGLAND.

### BEDS.

*Leighton Buzzard.*  
Reid, J. F.

### BERKS.

*Earley.*  
Easton, N. T.  
*Finchampstead.*  
Hyde, R. A.  
*Newbury.*  
Saundby, R. H. M. S.  
*Reading.*  
Baker, B. R.  
Dolton, H. L.  
Quinney, L. G.  
Runge, C.  
Williams, L. H.  
*Wallingford.*  
Newman, D. E.  
*Windsor.*  
Wykes, N. G.  
*Woolhampton.*  
Smith, F. W.

### BUCKS.

*Aylesbury.*  
Spittles, C. E.  
*Bletchley.*  
Kershaw, S. H.  
Richardson, N. A.  
*Great Missenden.*  
Stedall, H. P. P.  
*High Wycombe.*  
Oliver, G. B.  
Oliver, G. H. B.  
*Newport Pagnell.*  
Cripps, C. H.

### CAMBS.

*Cambridge.*  
Rivers, C. F.  
Storey, W. H.  
*Wisbech.*  
Elgood, W. S.

### CHESHIRE.

*Altrincham.*  
Wynn, R. A. W.  
*Bebington.*  
Prichard, R.

### Bromborough.

Snell, B. B.  
*Caldy.*  
Clarke, C. A.  
*Chester.*  
Smith, S. G.  
*Nantwich.*  
Boyes, J. D. C.  
*Northwich.*  
Crewdson, R. C. R.  
*Stalybridge.*  
Charlson, S.  
*Wilmslow.*  
Kloet, G. S.

### CORNWALL.

*Bude.*  
Harbottle, A. H. H.

### CUMBERLAND.

*Brampton.*  
Johnson, G. F.  
*Carlisle.*  
Day, F. H.  
*Penrith.*  
Hervey, G. A. K.

### DERBYSHIRE.

*Derby.*  
Atherly, Miss M.  
*Ilkeston.*  
Blasdale, P.

### DEVON.

*Ashburton.*  
Stidston, S. T.  
*Axminster.*  
Bliss, A.  
*Plymouth.*  
Watkins, O. G.  
*Newton Abbot.*  
Coleridge, W. L.  
*Sampford Peverell.*  
Lyon, F. H.  
*Torquay.*  
Lees, F. H.  
*Totnes.*  
Atkinson, J. L.

### DORSET.

*Broadmayne.*  
Philpott, V. W.  
*Dorchester.*  
Lisney, A. A.

*West Parley*  
King, H.  
*Wimborne.*  
Harwood, P.

## DURHAM.

*Barnard Castle.*  
Robson, J. P.  
*Gateshead.*  
Montgomery, J. R. P.  
*Sunderland.*  
Jefferson, T. W.

## ESSEX.

*Brentwood.*  
Stanley-Smith, F.  
Williams, D. M.  
Williams, E. F.  
Williams, E. P.  
*Colchester.*  
Blaxill, A. D.  
Ives, D. H.  
Pearson, A. J. R.  
*Harlow.*  
Forster, H. W.  
*Hornchurch.*  
Rawlings, C. J.  
*Hutton.*  
Friedlein, A. F. E.  
*Leigh on Sea.*  
Watts, W. J.  
*Loughton.*  
Lockington, N. A.  
Payne, R. M.  
Sutton, G. R.  
*Mistley.*  
Rose, I. C.  
*Rayleigh.*  
More, D.  
*Southminster.*  
Dewick, A. J.  
*Waltham Abbey.*  
Sculthorp, A. H.  
*Westcliff-on-Sea.*  
Huggins, H. C.  
*Woodford Green.*  
Smith, D. N. K.

## GLOS.

*Bourton-on-the-Water.*  
Renfrew, C.  
*Bristol.*  
Bell, C. L.  
Ellison, E. F. D.  
Hinton, H. E.  
Watkins, N. A.  
*Hardwicke.*  
Demuth, R. P.  
*Minchinhampton.*  
Richardson, A.  
*Quedgeley.*  
Thorpe, J.

*Stroud.*  
Peacey, A. F.  
*Tetbury.*  
Newton, J.

## HANTS.

*Alton.*  
May, J. T.  
Robinson, H. S.  
*Alverstoke.*  
Torlesse, A. D.  
*Andover.*  
Maxwell, R. M.  
*Basingstoke.*  
Goodliffe, F. D.  
*Bishopstoke.*  
Ray, H.  
*Bournemouth.*  
Brown, S. C. S.  
Curtis, W. P.  
Fraser, F. C.  
Murgatroyd, J. M.  
Symes, H.  
Turner, H. J.  
Whitehead, J.  
*Burley.*  
Mackworth-Praed, C. W.  
*Chandlers Ford.*  
Goater, B.  
*Christchurch.*  
Barton, B. C.  
Carr, F. M. B.  
*Eastleigh.*  
Curl, B. J. A.  
Holloway, P. H.  
*Farnborough.*  
Richards, A. W.  
*Fordingbridge.*  
Burton, P. J.  
*Gosport.*  
Burns, B. S.  
*Lymington.*  
Farwell, I. G.  
*Micheldever.*  
Dixon, C. H.  
*Portsmouth.*  
Langmaid, J. R.  
*Romsey.*  
Ransome, A. L.  
*Rowlands Castle.*  
Stanley, F. C.  
*Sandy Down.*  
Robinson, P. J. M.  
*Southampton.*  
Watson, R. W.  
*Warblington.*  
Sperring, A. H.  
*Winchester.*  
Blyth, S. F. P.  
Ffennell, D. W. H.

**HERTS.***Arkley.*

Howarth, H.  
Howarth, T. G.

*Barnet.*

Calderara, P.

*Bishop's Stortford.*

Allan, P. B. M.  
Ashwell, D. A.  
Craufurd, C.  
Mellows, C.

*Broxbourne.*

Thorn, B. A.

*Kings Langley.*

Dunk, H. C.

*Radlett.*

Howard, A. P.

*Redbourn.*

Bowden, S. R.

*St. Albans.*

Byers, F. W.  
Edwards, G. G.  
Janson, O. J.  
Wildridge, W.

*Tring.*

Cockayne, E. A.  
Goodson, A. L.

**HUNTS.***Wood Walton.*

Leeds, H. A.

**I. OF MAN.***Santon.*

Hedges, A. V.

**I.O.W.***Cowes, East.*

Saunt, J. W.

**KENT.***Ashford.*

Cue, P.  
Duffield, C. A. W.  
Rudland, W. L.  
Scott, E.

*Aylesford.*

Davis, G. A. N.

*Beckenham.*

Lane, A. W.

*Bexley.*

Ford, L. T.  
Newman, L. H.

*Borough Green.*

McDermott, C. A.

*Boxley.*

Frazer, J. F. D.

*Bromley.*

Cox, W. A. A.

Jacobs, S. N. A.

*Canterbury.*

Parry, J. A.

*Dartford.*

Hare, E. J.  
Scudder, G. G. E.  
West, B. K.

*Ditton.*

Llewelyn, J. R.

*Dover.*

Youden, G. H.

*East Malling.*

Massee, A. M.

*Folkestone.*

Gilliat, F. T.  
Morley, A. M.  
Self, K. W.

*Gillingham.*

Wallis, J. L. P.

*Gravesend.*

Southwood, T. R. E.  
Whitehorn, K. P.

*Littlebourne.*

Marsh, D. G.

*Maidstone.*

Grant, F. T.

*Meopham.*

Pounce, A. G.

*Orpington.*

Gowing-Scopes, E.  
Line, H. V.  
Siggs, L. W.

*Otford.*

Manley, W. B. L.

*Petts Wood.*

Taylor, J. O.

*Ramsgate.*

Lanfeare, A. H.

*Sandhurst.*

Bull, G. V.

*Sevenoaks.*

Busbridge, W. E.

*Shortlands.*

Morris, M. G.

*Sidcup.*

Ling, R. B.  
Taylor, H. G. W.

*Tatsfield.*

Ellis, J. E.

*Tonbridge.*

Blest, T.

*Westerham.*

Edwards, R. C.

*West Wickham.*

Chalmers-Hunt, M.  
Owen, G. V.  
Trundell, E. E. J.

*Wilmington.*

Honeybourne, T. J.

## LANCS.

- Accrington.*  
 Thornton, J.  
*Blackburn.*  
 Bryce, D.  
*Bolton.*  
 Coxey, S.  
*Burnley.*  
 Wrightson, A. L.  
*Formby.*  
 Davidson, A. R.  
 Leech, M. J.  
*Grange-over-Sands.*  
 Heath, J.  
*Manchester.*  
 Michaelis, H. N.  
 Wood, E. F.  
*Nelson.*  
 Brindle, A.  
 Jopson, F. L.  
*Southport.*  
 Greenwood, K. C.

## LEICESTERSHIRE.

- Market Harborough.*  
 Buckler, H. A.

## LINCS.

- Boston.*  
 Bowser, E. W.  
 Cooper, B. A.  
*Grantham.*  
 Platts, J. H.  
*Grimsby.*  
 Jeffs, G. A. T.  
*Market Rasen.*  
 Court, T. H.  
*Skellingthorpe.*  
 Small, H. M.

## LONDON.

- E.4. *Chingford.*  
 Pinniger, E. B.  
 Shaw, R. G.  
 Weal, R. D.  
 Williams, S. W. C.  
 E.7. *Forest Gate.*  
 Baxter, L. N.  
 Baxter, R. N.  
 E.11. *Wanstead.*  
 Butterfield, A. W.  
 Syms, E. E.  
 E.C.3.  
 Roche, C. G.  
 N.1. *Highbury.*  
 Buck, F. D.

- N.3. *Finchley.*  
 Griffiths, G. C. D.  
 N.6.  
 West, B. B.  
 N.8. *Hornsey.*  
 Janson, O. J.  
 Young, G. M.  
 N.10. *Muswell Hill.*  
 Chevallier, L. H. S.  
 N.12. *Finchley.*  
 Cross, G. S. E.  
 N.15. *S. Tottenham.*  
 Brooke, W. M. A.  
 N.19. *Holloway Road.*  
 Knight, F.  
 N.20. *Whetstone.*  
 Lorimer, R. I.  
 Lovell, R.  
 N.W.1. *Regent's Park.*  
 Hemming, A. F.  
 Talbot de Malahide.  
 N.W.3. *Hampstead.*  
 Spencer, K. A.  
 N.W.4. *Hendon.*  
 Webb, H. E.  
 N.W.6. *Hampstead.*  
 Hillaby, J. D.  
 N.W.7. *Mill Hill.*  
 Ellis, D. J.  
 N.W.8. *Regent's Park.*  
 Ashby, G. J.  
 Bushby, L. C.  
 Leston, D.  
 N.W.9. *Kingsbury.*  
 Turner, A. D.  
 S.E.2. *Abbey Wood.*  
 Showler, A. J.  
 S.E.3. *Blackheath.*  
 Gould, A. W.  
 S.E.5. *Ruskin Park.*  
 Wakely, S.  
 S.E.6. *Catford.*  
 LeGros, A. E.  
 Warrier, R. E.  
 S.E.18. *Plumstead.*  
 Green, J. A.  
 Hards, C. H.  
 Popham, W. J.  
 S.E.21. *Dulwich.*  
 Edwards, T. G.  
 S.E.25. *South Norwood.*  
 Cornelius, J. A.  
 Lewis, E.  
 Nissen, C. L.  
 S.W.1. *Westminster.*  
 Gordon, D. J.  
 Harrison-Gray, M.  
 Harvey, J. G.  
 Matthews, D. P. L.  
 Prideaux, A. G.

S.W.2. *Tulse Hill.*  
Hawgood, D. A.  
Newton, J. L.

S.W.3. *Chelsea.*  
Cadbury, B.  
Cork, C. H.

S.W.6. *Fulham.*  
Tams, W. H. T.

S.W.7. *S. Kensington.*  
Evans, E.  
Richards, O. W.

S.W.13. *Barnes.*  
Hodgkinson, A.

S.W.15. *Putney.*  
Swain, H. D.

S.W.16. *Streatham.*  
Christie, J.  
Christie, L.  
Daly, D. W.

S.W.17. *Tooting.*  
Allen, D. M.

S.W.18. *Wandsworth.*  
Hall, D. G.  
Michaud, J.

W.5. *Ealing.*  
Hanson, S. M.

W.6.  
Uffen, R. W. J.

W.8.  
Craske, R. M.

W.9.  
Peters, W.

W.14. *W. Kensington.*  
Astbury, C. F.  
Wiffen, R. C. G.

W.C.1.  
Feilden, G. St. Clair.  
Janson, D. B.

W.C.2.  
Pooles, S. W. P.

## MIDDLESEX.

*Bedfont.*  
Kindred, A. D.

*Eastcote.*  
Goodban, B. S.

*Enfield.*  
Eagles, T. R.

*Feltham.*  
Classey, E. W.

*Greenford.*  
Allen, P. V. M.

*Harrow.*  
Martin, E. L.  
Riordan, B. D.

*Hayes.*  
Moppett, A. A.

*Hounslow.*  
Gerard, B. McC.  
*Pinner.*

Minnion, W. E.  
Saunders, J. M. K.

*Stanmore.*  
Harris, W. H. A.

Hilliard, R. D.  
McCrae, A. W. R.

*Teddington.*  
Ferguson, L. F.

*Twickenham.*  
Stallwood, B. R.

## NORTHANTS.

*Road.*  
Humphrey, S. W.  
*Wellingborough.*  
Gent, P. J.  
Payne, J. H.

## OXFORDSHIRE.

*Oxford.*  
Bailey, K. E. J.  
Ford, E. B.  
Kettlewell, H. B. D.  
Varley, G. C.

## SOMERSET.

*Burnham-on-Sea.*  
Heslop, E. A.  
Heslop, I. R. P.  
*Frome.*  
Cruttwell, G. H. W.  
*Misterton.*  
Lipscomb, C. G.  
*Taunton.*  
Turner, A. H.  
*Wells.*  
Thompson, J. A.  
Valentine, A.  
*Weston-super-Mare.*  
Blathwayt, C. S. H.

## SUFFOLK.

*Ipswich.*  
Beaufoy, S.  
White, E. M. S.

## SURREY.

*Ashted.*  
Brush, H. J.  
May, R. M.  
Young, L. D.  
*Banstead.*  
Gardner, A. E.  
Last, H. R.  
Perry, K. M. P.  
Rumsey, F.

- Bletchingley.*  
 Hickin, N. E.  
*Bookham, Great.*  
 Collins, R. J.  
*Camberley.*  
 Parfitt, R. W.  
*Carshalton Beeches.*  
 Thorpe-Young, D. W.  
*Cheam.*  
 Baker, D. B.  
 Struthers, F. M.  
 Turner, J. F.  
*Churt.*  
 Baker, J. A.  
*Chiddingfold.*  
 Mere, R. M.  
*Chipstead.*  
 Bolton, E. L.  
*Chobham.*  
 Quarrington, C. A.  
*Claygate.*  
 Perkins, J. F.  
*Cobham.*  
 Purefoy, J. B.  
*Coulsdon.*  
 Denvil, H. G.  
 Ferrier, W. J.  
*Coulsdon (Old).*  
 Britten, H.  
*Cranleigh.*  
 Collier, A. E.  
*Dorking.*  
 Atty, D. B.  
 Carter, R. A.  
 Cole, G. A.  
 Haynes, R. F.  
 Howard, J. O. T.  
*Epsom.*  
 Vallins, F. T.  
*Esher.*  
 Brett, G. A.  
 Craske, J. C. B.  
 Ennis, L. H.  
 Short, H. G.  
*Ewell.*  
 Tunstall, H. G.  
*Ewell (East).*  
 Lang, R. M.  
 Wells, H. O.  
*Farnham.*  
 Moore, B. P.  
*Frensham.*  
 Gurdon, J. B.  
*Godalming.*  
 Stanners, L. S.  
 Williams, H. B.  
*Guildford.*  
 Garland, W. A.  
 Holroyd, G. C.  
*Hersham.*  
 Moore, D. R.  
*Horsley (East)*  
 Crow, P. N.  
*Kingswood.*  
 Coxon, G. F.  
*Leatherhead.*  
 Watson, D.  
*Leigh.*  
 Fairclough, R.  
*Merton Park.*  
 Coulson, F. J.  
*Morden.*  
 Ollevant, D.  
*New Malden.*  
 Spreadbury, W. H.  
*Ottershaw.*  
 Bretherton, R. F.  
 Parsons, R. E. R.  
*Pirbright.*  
 Lawson, H. B.  
*Purley.*  
 Doudney, S. P.  
 Henderson, J. L.  
 Walker, D. H.  
*Redhill.*  
 Rait-Smith, W.  
*Retgate.*  
 Petersen, K.  
 Ryle, G. B.  
*Richmond.*  
 Phelps, C. C.  
 Whicher, L. S.  
*Sanderstead.*  
 Russwurm, A. D. A.  
*Selsdon.*  
 Foster, T. B.  
 Wild, E. H.  
*Stoneleigh.*  
 Hutchings, H. R.  
*Sutton.*  
 Bolingbroke & St. John.  
 Currie, P. W. E.  
 Danby, G. C.  
 Frohawk, M. J.  
 Summers, E. J.  
*Tadworth.*  
 Wheeler, A. S.  
*Thornton Heath.*  
 Parmenter, L.  
*Wallington.*  
 Brown, F. C.  
 Niblett, M.  
*Weybridge.*  
 Best, A. A.  
 Messenger, J. L.

*Wimbledon.*

Bradley, J. D.  
Hawkins, C. N.  
Jarvis, C. McK.  
Riley, N. D.  
Tubbs, M.  
Tubbs, R. S.  
Wakely, L. D.

*Woking.*

Stoughton-Harris, G.  
Worms, C. G. M. de.

*Worcester Park.*

Hyde-Wyatt, B.  
Richardson, A. E.  
Stafford, A. E.

## SUSSEX.

*Arundel.*

Haggett, G. M.

*Bullingshurst.*

Curtis, A. E.

*Bognor Regis.*

Clark, J.  
Jarvis, F. V. L.

*Brighton.*

Banner, J. V.  
Beard, J. W.  
Dyson, R. C.

*Buxted.*

Odd, D. A.

*Chichester.*

Boyce, B.

*Chiddingly.*

Humphrey, J. C.

*Crawley.*

Gibbins, M. J.

*Eastbourne.*

Ellison, E. F. D.  
Ellison, R. E.  
Marcon, J. N.  
Smith, D. S.  
Wallis-Norton, S. G.

*Ferring-by-Sea.*

Menzies, I. S.

*Hailsham.*

Manley, G. E. L.

*Horsted Keynes.*

Hoare-Ward, J. W.

*Littlehampton.*

Jay, E. P.

*Newick.*

Embry, B.

*Plaistow.*

Owers, D. E.

*Pulborough.*

Robertson, G. S.  
Wightman, A. J.

*Ringmer.*

Gully, J. G.

*Wisborough Green.*

McClure, A. M.

*Worthing.*

Edwards, F. H.

## WARWICKSHIRE.

*Birmingham.*

Bowater, W.  
Evans, L. J.  
Hammond, H. E.  
Siviter Smith, P.  
Timms, C.

*Olton.*

Wainwright, C

*Solihull.*

Allen, D.  
Carlier, S. E. W.  
Price, G. C.

*Stoke Golding.*

Murray, D. P.

*Tysoe.*

Trought, T.

## WESTMORLAND

*Kendal.*

Birkett, N. L.

## WILTS.

*Ramsbury.*

Fraser, R. A.

*Salisbury.*

Temple, V.

*Tilshead.*

Gilman, H. C. R.

*Trowbridge.*

Weddell, B. W

*Warminster.*

Jackson, R. A

## WORCESTERSHIRE.

*Evesham.*

Burton, R. J.

*Redditch.*

Latham, F. H.

## YORKS.

*Doncaster.*

Hyde, G. E.

*Dronfield.*

Fearnehough, T. D.

*Hull.*

Rogers, G. B.  
Wade, D.

*Leeds.*

Taylor, A. S.

*Rotherham.*

Wilkinson, W.

*Sheffield.*

Reid, W

*Shipley.*

Hewson, F  
Kemp, J. K. C.

*York.*

Smith, A.



**IRELAND.****CO. DUBLIN.***Glenageary.*

Baynes, E. S. A.

**SCOTLAND.****ABERDEENSHIRE.***Aberdeen.*

Morison, G. D.

**DUMFRIES-SHIRE.***Colltn.*

Balfour-Browne, W. A. F.

*Dumfries.*

Cunningham, D.

**INVERNESS-SHIRE.***Newtonmore.*

Harper, G. W.

Harper, M. W.

**MIDLOTHIAN.***Edinburgh.*

Dunbar, J. G.

Macnicol, D. A. B.

Pelham-Clinton, E. C.

**WALES.****DENBIGH.***Wrexham.*

Eckford, E.

**GLAMORGAN.***Port Talbot.*

Morgan, H. D.

**ABROAD.****EUROPE.***Austria.*

Klimesch, J.

*Czeckoslovakia.*

Polacek, V. B.

*Denmark.*

Carolsfeld-Krause, A. G.

Olsen, E. T.

*France.*

Herbulot, C.

Kummerer-Naegele, H.

Viette, P. E. L.

*Italy.*

Storace, L.

*Sweden.*

Torstenius, S.

**AFRICA.***Cape Province.*

Taylor, J. S.

*Kenya.*

Hollebone, L. H. T.

*Nigeria.*

MacNulty, B. J.

Roche, P. J. L.

*Tanganyika.*

Dudbridge, B. J.

*Uganda.*

Sevastopulo, D. G.

**AMERICA.***Argentina.*

Hayward, K. J.

*Canada.*

Beirne, B. P.

*Connecticut (U.S.A.).*

Gifford, W. S.

*Washington, D.C. (U.S.A.).*

Hall, S. S.

**ASIA.***Hong Kong.*

Burkhardt, V. R.

*India.*

Wakely, L. J. D.

*Japan.*

Asahina, S.

*Malaya.*

Stubbs, G. C.

Tweedie, M. W. F.

**AUSTRALIA.***New South Wales.*

O'Farrell, A. F.

*Tasmania.*

Couchman, L. E.

## COUNCIL'S REPORT for 1954-55.

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On the 31st December last the membership of the Society stood at 506, made up of 3 Honorary, 4 Special Life, 14 Life, 239 Ordinary and 246 Country Members. During the past year, 5 deaths have occurred and these will be referred to later by your President. Resignations were received from 18 members, and 3 were struck off for non-payment of subscriptions. The drop in total membership, which stood at 515 a year ago, is mainly the result of considerably fewer new members having been enrolled—17, compared with 38 in 1953. This downward movement is relatively slight, and it is expected that the customary upward trend will be resumed in the near future. It is of interest to note that, for the first time in the history of the Society, the Country Members outnumber the Ordinary Members.

After eleven years as our Curator, Mr. F. J. Coulson has reluctantly tendered his resignation. The Society is greatly indebted to him for his skilful and painstaking work on our behalf. Fortunately, we have an able successor in Mr. A. E. Gardner.

A rather disconcerting event, with which your Council had to contend, was the withdrawal by the Royal Society of the facilities for housing our collections and library on their premises at Burlington House. The rooms in the basement, which had been so kindly placed at our disposal for a number of years, were required by the Royal Society for their own use. Notice to this effect was received by us early in April, and we were asked to remove our property by 1st August. Despite persistent efforts to find alternative accommodation, nothing suitable was found in the time available, and the Society had no alternative to seeking members who were willing to house the collections and library in their homes, as a temporary measure. An effort was made to ensure that each member offering assistance in this way received cabinets containing Orders in which he is interested, thus enabling some use to be made of the collections whilst they are out of reach of most of the members. They could also receive a certain amount of expert attention. The cabinets are now in the custody of Dr. B. P. Moore and Messrs. V. E. August, A. E. Gardner, R. S. Tubbs and F. T. Vallins, whilst the whole of the books and bookcases are in the care of Mr. S. Wakely. Mr. D. Leston has housed the stock of Proceedings and Transactions. It is with extreme regret that your Council has been compelled to separate the collections and library from the Ordinary Meetings, and it is hoped that a better solution of the problem will soon be found. In the meantime, members are reminded that any book in the library may be borrowed by post, and it is the wish of your Council that full use be made of this service. Application should be made to Mr. S. Wakely or any of the Society's officers.

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NOTE.—The library and collections have been available at 14 Rochester Row since July 1955.

During the past year, the plan to co-operate with the Nature Conservancy by carrying out entomological surveys on the areas in which they have an interest, has made considerable progress. Sites for survey were allotted to 62 members who had intimated their desire to be included in this scheme. They were provided with large scale maps, defining the boundaries of the areas to be worked, and entrance permits when these sites were declared Nature Reserves. In the case of Sites of Special Scientific Interest, permits could not be issued by the Conservancy as the ownership was in other hands. In all, 78 sites, in 26 counties, were allotted, and it is believed that members participating in this plan have derived much pleasure from this useful and instructive work. Unfortunately, atrocious weather rendered much of the year unsuitable for entomological field work. Nevertheless, much has been accomplished, and the Conservancy have expressed their appreciation of the efforts being made on their behalf. Owing to the impossibility of completing a satisfactory survey in one year, even under suitable climatic conditions, your Council has agreed with the Conservancy to continue with the scheme for at least another year. At the present time, a list of the species taken or observed will be sufficient to constitute an adequate interim report from each worker.

Another request for assistance came from the Juniper Hall Field Centre of the Council for the Promotion of Field Studies, which require help in compiling records of plants and animals from Surrey, especially from Box Hill, Leith Hill, and heathlands of West Surrey. Several members responded, but this appeal for records remains open, and those willing to help should communicate with Mr. John Sankey, the Assistant Warden.

Thanks are due to the lecturers and exhibitors who contributed to the success of the 21 Ordinary Meetings held during the year. The papers read covered a wide range of subjects and dealt with many different Orders of Insecta; the lantern and epidiascope were in frequent use. On two occasions we were indebted to the Linnean Society of London for the use of their rooms as the Meeting Room of the Royal Society was not available. The average attendance was 49.

A full and pleasantly varied programme of Field Meetings was arranged by Mr. S. Wakely, to whom we are most grateful. In the 26 meetings, a number of new localities were included. These aroused considerable interest, and were well supported. A coach trip to Salcey Forest, Northants, provided a welcome introduction to a promising district, hitherto quite unfamiliar to most of the members, but indifferent weather prevented full advantage being taken of the occasion. Much enjoyment was added to the visits to Chailey and Scratch Wood by kind invitations from Mrs. Odd and Mrs. Howarth to take tea at their homes in the vicinity. We are most grateful to them for their thoughtfulness and hospitality.

The Annual Dinner was held at the Waldorf Hotel, Aldwych, where the pleasant atmosphere of the rooms used contributed much to the

enjoyment of 95 members and guests who attended. The custom of inviting a Guest Society was discontinued, all guests being invited individually. These were Professor O. W. Richards of the Imperial College of Science and Technology; Dr. C. B. Williams, F.R.S., Head of Department of Entomology, Rothamsted Experimental Station; Mr. P. H. Cooper, Administrative Secretary of the Nature Conservancy; and Dr. D. C. Martin, Mr. I. Kaye and Mr. W. M. Malcolm of the Royal Society, and their ladies.

Despite the extremely bad summer, the display at the Annual Exhibition was well up to the usual high standard. There was very little evidence in the excellent range of exhibits that it had been such a poor year for insect life, and the high quality of the exhibits was a tribute to the enthusiasm and ability of the exhibitors. The Orders for special emphasis were Diptera and Hymenoptera, of which an interesting display was prepared. Hitherto, exhibits of 'other Orders' had been mainly confined to the Council Chamber, but an innovation this year was the allocation to these Orders of an additional table in the library. Full advantage was taken of this extra space, and the result was most gratifying and justified the experiment. In an attractive living display by the Zoo was a selection of interesting spiders, centipedes and stick-insects. The Infestation Control Division of the Ministry of Agriculture and Fisheries provided an instructive exhibit of pests of stored products. Mr. Tams once more earned our gratitude by devoting so much time to the photographing of selected insects.

The Proceedings and Transactions for 1952/53 were not published until late in March, 1954, and contained xlv + 141 pp., 9 plates (2 coloured) and 18 text figures. Unfortunately, a similar delay has occurred this year, but it is not likely to be so protracted, although a definite date for publication cannot yet be fixed.

Your Council has drawn up a short list of 'Instructions to Speakers' to ensure that no misunderstanding arises over the Society's rights to decline or accept for publication any paper submitted. These instructions will be printed in the Proceedings.

For the last two years it has been the practice to send with the notice announcing the Annual Exhibition a printed slip headed 'Instructions to Exhibitors'. It is appreciated that this could easily be mislaid, and, to have this always available for reference, it will be reproduced in the Proceedings.

The Curator reports that donations of specimens for the collections were made during the year by Mr. L. Christie (Lepidoptera, Diptera and Heteroptera). Mr F. D. Buck (Coleoptera with parasite), Mr. A. E. Gardner (Neuroptera), Rev. D. P. Murray, Dr. B. P. Moore and Mr. F. T. Vallins (Lepidoptera). The best thanks of the Society are due to these members.

The Librarian reports it is hoped to clear up arrears of binding

during the next few months. Members' attention is drawn to the suggestions book—suggestions for the purchase of library books may be entered there.

A list of additions to the library during 1954 follows:—

By gift:—Royal Ent. Soc. Lond., *Transactions and Proceedings* of that society, 1954.

By Purchase or Exchange:—Entomologist; Entomologist's Monthly Magazine; Entomologist's Gazette; Entomologist's Record; Canadian Entomologist; Entomological News; Tydschrift voor Entomologica; Opuscula Entomologica; Zoologiska Bidrag; Mitteilungen; Beitrage Zur Entomologie; Lloydia; Wisconsin Academy of Science, Trans.; Fieldiana, Zoology; Bulletin, Societe Entomologique de Belgique; Essex Naturalist; London Naturalist and Bird Report; Proc. I.O.W. Nat. His. Soc.; Lincolnshire Nat. Union; Norfolk and Norwich Nat. Soc. Trans.; Natural History, New York; Smithsonian Institute Reports.

## TREASURER'S REPORT for 1954.

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It is gratifying to be able to report favourably on the Society's financial affairs in a second consecutive year. The audited Accounts, which I shall presently propose be adopted, show a substantial surplus, although it is not so large as in 1953.

### CAPITAL ACCOUNT.

The amount of this Fund has been increased by £12, the proceeds of the sale of a small cabinet which was no longer required. In addition £6 7s 6d, the entrance fees of 17 members, has been transferred to the Library Fund as usual.

### BALANCE-SHEET.

The Cash position at 31st December 1954 was even stronger than a year previously, the amount in hand and on deposit being £776 16s 11d in all. This will permit of further investment at an early date to bring the present value of our securities up to the Capital represented, at the same time increasing income by way of interest. Our investments also have appreciated, the market value being £1276 at the end of the year.

### INCOME AND EXPENDITURE.

Interest from investments and subscriptions actually received amounted to some £19 less than in the previous year, while the various expenses were in most cases a little lower. After defraying the cost of removing the library and collections to their present temporary quarters and making a grant of £355 to the Publication Fund, there is a surplus of £78 10s 11d for the year, which brings the total accumulation of Revenue to £300 7s 5d.

### PUBLICATION FUND.

It is estimated that the cost of issuing the "Proceedings and Transactions, 1953/54", will be £350. The Stock of Publications, valued at £65 at the close of 1953, has been written off. To meet all this, the amounts received from the sale of publications, War Loan interest, donations, and a small balance brought forward, together with the grant from Revenue already mentioned, will leave this Fund with a few shillings in hand, its usual condition at this time of year.

We have to thank the same Honorary Auditors once again for their good offices in connection with the accounts.

**BALANCE SHEET at 31st December 1954.**

Capital Fund—			
General	...	...	£1,083 0 3
Publication	...	...	304 19 9
			<hr/> £1,388 0 0
Special Funds—			
Library	...	...	£81 4 1
Publication	...	...	1 18 7
			<hr/> 83 2 8
Subscriptions Paid in Advance	...	...	31 5 6
Sundry Creditors	...	...	350 0 0
Income and Expenditure Account—			
Balance at 1st January 1954	...	...	£221 16 6
Add Excess of Income over Expenditure for the year	...	...	78 10 11
			<hr/> 300 7 5

*Note.*—The Society's Books, Cabinets, Furniture, etc., are Insured for £2,000, and the Hon. Secretary's Office Equipment for £100.

**Audited and found correct.**

F. J. COULSON.  
G. STOUGHTON-HARRIS, F.C.A.

26th January 1955.

J. L. HENDERSON, Hon. Treasurer.

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£300 0s 0d 3½% War Stock	...	...	304 19 9	
				£1,368 8 3
<hr/>				
Note.—Market value at 31st December 1954, £1,276.				
Sundry Debtors	...	...	...	7 10 5
Cash at Bank—				
Deposit Account	...	...	£519 8 4	
Current Account	...	...	237 3 0	
				756 11 4
Cash in Hand	...	...	...	20 5 7
				£2,152 15 7
				<hr/>

**INCOME AND EXPENDITURE ACCOUNT—Year ended 31st December 1954.**

Rent of Rooms	...	...	...	...	...	£67 19 0
Insurance	...	...	...	...	...	2 2 5
Cleaning and Gratuities	...	...	...	...	...	3 10 0
Secretarial Expenses	...	...	...	...	...	41 17 11
Treasurer's Expenses	...	...	...	...	...	5 12 10
Removal	...	...	...	...	...	30 5 0
						£151 7 2
Subscriptions to Wicken Fen Fund, Footpaths Preservation Society, Ramblers' Association, National Trust, Protection Fund of the Royal Entomological Society, Council for the Promotion of Field Studies and Conservators of Oxshott Heath						
Annual Exhibition Expenses	...	...	...	...	...	9 9 0
Annual Dinner Expenses	...	...	...	...	...	14 9 0
Grant to Publication Fund	...	...	...	...	...	12 13 3
Balance being Excess of Income over Expenditure, carried to Balance Sheet	...	...	...	...	...	355 0 0
						78 10 11
						£621 9 4

## CAPITAL ACCOUNT—Year ended 31st December 1954.

[illegible]



# LIBRARY FUND—Year ended 31st December 1954.

Purchases—Books, etc. ...	£18 8 4	Balance at 1st January 1954 ...	£93 4 11
Balance at 31st December 1954 ...	81 4 1	Entrance Fees ...	6 7 6

£99 12 5

£99 12 5

# PUBLICATION FUND—Year ended 31st December 1954.

Stock on Hand 1st January 1954 ...	£65 0 0	Balance at 1st January 1954 ...	£3 7 6
Printing and Posting the "Proceedings and Transactions" 1953/54 ...	£255 0 0	Surplus provision for 1952/53 issue of "Proceedings and Transactions" ...	25 3 5
Blocks and Printing the Plates ...	95 0 0	Sales of "Proceedings" ...	20 13 2
	350 0 0	Interest—£300 0s 0d 3½% War Stock (Misses E. F. and L. M. Chapman) ...	10 10 0
Balance at 31st December 1954 ...	1 18 7	Donations ...	1 2 6
		Sales of "A Guide to the Smaller British Lepidoptera" ...	1 2 0
		Grant from Income and Expenditure Account ...	355 0 0

£416 18 7

£416 18 7

## ABSTRACT OF PROCEEDINGS.

### INDOOR MEETINGS.

10th FEBRUARY 1954.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. A. E. GARDNER—Trichoptera:—(1) *Phryganea striata* L., a short series from Surrey and Rothiemurchus, Aviemore, Inverness-shire, showing the different colour forms; (2) *Limnephilus xanthodes* McLach., a short series from Hickling Broad, Norfolk, taken by beating marginal oaks, 30th May, 1953.

Mr. T. R. EAGLES—Seed pods of the Water Chestnut, *Trapa natans* L. (Onagraceae) from Greece and of other species from India.

Mr. B. K. WEST—A collection of butterflies and moths made in the Bahamas.

#### COMMUNICATIONS.

The Librarian, Mr. D. Leston, showed and commented on several important new books which he had recently added to the Society's Library.

*Erannis leucophaearia* Schiff. had been seen on 24th January despite a strong East wind.

Mr. B. K. WEST read a paper, "Lepidoptera Collecting in the Bahamas".

24th FEBRUARY 1954.

The PRESIDENT in the Chair.

The death of Dr. E. Barton White was announced.

#### EXHIBITS.

The PRESIDENT—Moths of the Pyraline genus *Marionodes* Viette from Madagascar. This is a new genus comprising two new species, *M. seyrigalis* Viette, the genotype, and *M. diehlalis* Viette. The two specimens of *M. seyrigalis* were determined by Viette from material received from Dr. E. Diehl of Madagascar, and he also described the type and two paratypes of *M. diehlalis* from this material. The types are both in the French National Museum. The genus and species are described in the Bulletin Mensuel de la Société Linnéenne de Lyon, October 1953, Vol. 22, No. 8, pp. 203-205.

Mr. D. LESTON—Larvae of the Tortrix moth *Cacoecia pronubana* Hb. feeding on leaves of Cherry-Laurel, *Prunus laurocerasus* L., London, N.W.8, 24th February, 1954.

Mr. L. S. WHICHER—Paratypes of recently described species of *Aphodius* (Col., Scarabaeidae):—*A. rossi* Cartwright and *A. sepultus* Cartwright from Texas, *A. geomysi* Cartwright from Florida and *A. brimleyi* Cartwright from South Carolina.

Mr. K. A. SPENCER—(a) Living specimen of *Phytagromyza hendeliana* Her., which emerged on 22nd February from mine—collected near Lisbon on 15th March 1953—on *Lonicera* sp. (b) A specimen of *Agromyza rufipes* Mg. and of *Ptochomyza asparagi* Her. illustrating the size range in the family Agromyzidae. *P. asparagi* Her. is the smallest known Agromyzid. (c) A puparium of *Melanagromyza lappae* Loew in a stem of *Arctium lappa*, collected at Scratch Wood, 14.2.54. (d) Examples of pairs of mines in a single leaf, illustrating the importance of mines as an aid to the identification of Agromyzids: 1. *Arctium lappa*: *Phytomyza lappina* Gour. and *Pegomyia* sp. (Anthomyidae). 2. *Heracleum sphondylium*: *Phytomyza spondylii* R.-D. and *Phytomyza* sp. n. (not yet bred). 3. *Artemisia vulgaris*: *Liriomyza artemisicola* de Meij. and *Phytobia artemisiae* Kalt. 4. *Laburnum anagyroides*: *Agromyza demeijeri* Hd. and *Phytomyza citisi* Bri. 5. *Sonchus oleraceus*: *Liriomyza strigata* Mg. and *L. sonchi* Her. (e) Mines and flies of two species new to science: *Liriomyza* sp. nov. bred from *Eupatorium cannabinum*, Heddington, Wilts, 3.8.53, and *Phytomyza* sp. n. bred from *Smyrniolum olusatrum*, near Lisbon, 8.11.53.

#### COMMUNICATION.

Mr. K. A. SPENCER read a paper, "The British Agromyzidae (Dipt.)." (See *Trans.*)

10th MARCH 1954.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. D. LESTON—A collection of the Amyotinae (Hem., Pentatomidae) comprising the four British species and others from North and South America, Australia and New Zealand.

Mr. S. WAKELY—A series of the ant *Formica pratensis* Retz. from Dorset sent by Mr. S. C. S. Brown for the Society's collection. He read the following note: "Mr. S. C. S. Brown, of Bournemouth, has sent along these specimens of *Formica pratensis* Retz. for the Society's collections. *Formica pratensis* is one of the rarest of our wood ants. It occurs in Dorset, and, according to Dr. Yarrow, these specimens are not quite typical, as they are not dark enough—nevertheless they are definitely *pratensis*. Donisthorpe gives Northumberland, Cumberland, Mid Perth and Easternness as other localities, but little is known of this rare ant nowadays in these northern counties, although it is known in several places in Dorset and south Hampshire. As can be seen, the species is very like the common *Formica rufa* L. According to Donisthorpe, the two species have been recorded from the same nest, together

with hybrids, the name *rufo-pratensis* Forel being given to intermediate forms. Dr. Yarrow says there is no such thing as *rufo-pratensis* as described by Donisthorpe in his book, but admits there is some degree of variation in various colonies of *pratensis*."

#### COMMUNICATION.

Mr. D. LESTON read a paper "Caterpillar-feeders; a Biology of the Amyotinae (Hem., Pentatomidae)".

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24th MARCH 1954.

The PRESIDENT in the Chair.

Messrs. S. Beaufoy, B.Sc., A.M.I.E.E., F.R.P.S., F.R.E.S., F. C. Brown, F.Z.S., P. Cue and Cmdr. L. S. Stanners, R.N.Z.N., were declared elected members.

#### EXHIBITS.

The PRESIDENT—A series of Continental examples of the Phycitid moth *Heterographis oblitella* Zell. which has recently been recorded from Britain. He read the following Note: "This species is an occasional visitor, and may possibly be more frequent than the three or four existing records would indicate. The series shows something of the range of this insect's variation".

Mr. A. E. GARDNER—Palaeartic Dermaptera and Orthoptera recently presented to him by Prof. R. Ebner of Vienna:—*Anechura bipunctata* F. (Derm.) and the following Orthoptera—*Ectobius sylvestris* Poda, *Pholidoptera aptera* F., *Decticus verrucivorus* L., *Aeropus sibiricus* L. and *Stauroderus biguttulus* L.

Mr. J. O. T. HOWARD—A ♂ of the moth *Aporophylla nigra* Haw. showing two long white brushes protruding one on each side of the thorax near the base of the hind legs, used for distributing an aphrodisiac scent.

Mr. F. RUMSEY—Series of the following Lepidoptera:—*Panaxia dominula* L. from Wilts. and Kent; *Philereme transversata* Hufn. from Banstead and Horsley, Surrey; *Chesias legatella* Schiff. from Effingham, Surrey; *Campaea margaritata* L. from Banstead, Surrey; *Nonagria typhae* Thnbg. from Lewes, Sussex and Tyrone, Northern Ireland and *Polia nebulosa* Hufn. from Banstead, Surrey and Bexley, Kent.

Mr. M. HARRISON-GRAY—Living larvae of exotic Lepidoptera:—*Rothschildia jacobaeae* Wlk. (Saturniidae), *Eacles magnifica opaca* Burm. and *Citheronia brissotii* Boisd., the two latter *Ceratocampidae*.

Mr. C. F. RIVERS—(1) Half-grown larvae of *Aglaia urticae* L. reared with the aid of a 500 watt tungsten lamp; (2) Larvae of *Tinaea pellionella* L. killed by polyhedral virus disease.

There was a discussion on "What have Mercury Vapour Traps achieved?". This was introduced by Mr. H. S. ROBINSON and about 20 members spoke.

14th APRIL 1954.

The PRESIDENT in the Chair.

It was announced that Mr. A. G. B. Russell, C.V.O., F.R.E.S., had been appointed Clarenceux King of Arms.

#### EXHIBITS.

The PRESIDENT—Proofs of the last four coloured plates for a second edition of Beirne, Bryan P., 1952, *British Pyralid and Plume Moths*.

Mr. F. D. BUCK—An example of *Coccinella septempunctata* L. (Col., Coccinellidae) with a Hymenopterous parasite which he bred from it. The parasite emerges from between the ventral segments leaving no obvious traces of its exit.

Mr. H. D. SWAIN—Nymphs of dragonflies taken in the Basingstoke canal, Hants., 13th April 1954:—(1) *Aeshna* species in penultimate instar; (2) *Libellula quadrimaculata* L. and (3) *Coenagrion puella* L.

Mr. D. A. ASHWELL—Specimens of the dragonfly *Ischnura pumilio* Charp. from Perranwell Marshes near Truro, Cornwall. He read the following note: "The Cornish colony was originally discovered about 1893, but was thought to have died out until re-discovered in 1942 in a flourishing condition. The colony continued to flourish until about 1949, when the marshes were drained and the habitat destroyed. The specimens include the var. *aurantiaca* Selys, red teneral form of the female. The species is on the wing in June, July and August".

Dr. B. P. MOORE—Living examples of the following Coleoptera:—(1) *Liliocercis lili* Scop. from Chobham, Surrey, and (2) *Dinarda dentata* Grav. from a nest of the ant *Formica sanguinea* Latr. at Frensham, Surrey.

Mr. IAN S. MENZIES—The beetle *Chrysolina violacea* Muell. from Bury Hill, West Sussex.

Mr. M. HARRISON-GRAY—Larvae of the Bull's Eye Moth, *Automeris viridescens* Walk. from Argentina.

Mr. S. WAKELY—Imagines of the moth *Bapta distinctata* H.-S. taken at Ockham, Surrey, at the Field Meeting of 10th April.

#### COMMUNICATION.

Mr. A. E. GARDNER read a paper, illustrated by the Lantern:—"The Biology of Dragonflies". (See *Trans.*)

28th APRIL 1954.

The PRESIDENT in the Chair.

Mr. F. H. Lyon, M.B.E., F.R.E.S., was declared elected a member.

#### EXHIBITS.

Mr. S. R. BOWDEN—About 500 set specimens of reared hybrid butterflies (*Pieris napi* L. × *bryoniae* Ochs. and other hybrids) arranged to illustrate his paper.

Mr. K. A. SPENCER—A stem of *Angelica sylvestris* L. about 18 inches long with 24 emergence holes of the Agromyzid fly *Melanagromyza lappae* Loew.

Mr. S. WAKELY—A pupa and an imago of the Syrphid fly *Microdon eggeri* Mik from an ant's nest, Oxshott, Surrey.

Mr. D. A. ASHWELL—Caterpillars of the moth *Cirrhia ocellaris* Borkh. obtained by collecting catkins of black poplar near Mildenhall, Suffolk.

Mr. R. W. J. UFFEN—A teratological leaf of a tulip and a specimen of the moth *Eurrhynx hortulata* L. taken on 22nd April in a house in London.

Mr. V. E. AUGUST—A flowering plant of the introduced Aroid *Lysichiton americanum* Hutton St. John found growing in a pool at Black Park, Bucks.

Mr. C. N. HAWKINS—Coleoptera:—(1) *Euophrys confinis* Broun, Wimbledon Common, Surrey, in an old birch stump. (2) *Nargus anisotomoides* Spence found under the bark of a dead beech at Boxhill, Surrey, 17th April 1954.

Mr. T. R. EAGLES—A larva of the moth *Mormo maura* L. found at Enfield, Middlesex.

#### COMMUNICATIONS.

Mr. S. R. BOWDEN read a paper, illustrated by the lantern, "Hybrids within the European *Pieris napi* species-group (Lep., Pieridae)". (See *Trans.*)

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12th MAY 1954.

The PRESIDENT in the Chair.

Mr. D. N. Kent Smith was declared elected a member.

#### EXHIBITS.

BARON DE WORMS—Four forms of the larva of *Orthosia incerta* Hufn.

Mr. S. WAKELY, on behalf of Mr. D. MORE—(1) A living specimen of the water beetle *Hydrophilus piceus* L. (2) An imago and ova of *Chaonia ruficornis* Hufn. (3) An imago of *Chesias rufata* F.

Mr. C. N. HAWKINS—The beetles *Librodor quadriguttatus* F. and *L. hortensis* L. (= *quadripunctatus* Oliv.) taken at the Field Meeting at Effingham, Surrey, 8th May 1954.

Mr. G. C. D. GRIFFITHS—A willow twig twisted into a knot at the base, but in flourishing growth, Bookham, Surrey, 2nd May 1954.

Mr. V. E. AUGUST—Blooms of the following British orchids:—*Ophrys sphegodes* Mill., *Orchis mascula* L. (a white form) and *O. purpurea* Huds.

Mr. A. E. GARDNER—Hemiptera:—*Zicrona caerulea* L., a pair from Banstead, Surrey, 9th April 1954.

## COMMUNICATION.

Mr. F. D. BUCK read a paper, illustrated by the lantern, "Black and White Entomological Drawing for Reproduction". (See *Trans.*)

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26th MAY 1954.

The PRESIDENT in the Chair.

Canon G. A. K. Hervey and Mr. J. Whitehead were declared elected members.

## EXHIBITS.

Mr. L. CHRISTIE on behalf of Mr. R. M. MERE—Larvae of *Poecilopsis lapponaria* Boisd. bred from ova laid by a ♀ from Aviemore, Inverness. These were for distribution among members.

Mr. A. W. GOULD—The weevil *Liophloeus tessulatus* Muell., one typical and the other ab. *maurus* Marsh, beaten from ivy, 22nd May 1954, High Halstow, Kent. The black variety *maurus* is uncommon. The exhibited insect was almost devoid of scales except for a light grey covering on the tibiae and tarsi. It was quite fresh and showed no sign of rubbing.

Mr. S. WAKELY—Larvae of the Adelid moth *Nemophora fasciella* F. These were taken at the Stanford-le-Hope Field Meeting, 22nd May 1954.

Mr. F. RUMSEY—(1) Larvae of *Melitaea cinxia* L. bred from a ♀ taken at the Society's Isle of Wight Field Meeting of 1953; (2) larvae of *Apamea ypsilon* Schiff. (*Dyschorista fissipuncta* Haw.). These were taken freely at the base of a willow tree at Stanford-le-Hope as above.

## COMMUNICATIONS.

There was a discussion on the best criteria for distinguishing the species of Bruchidae (Col.).

Mr. R. F. HAYNES gave a brief account of his recent collecting holiday in the Killarney district.

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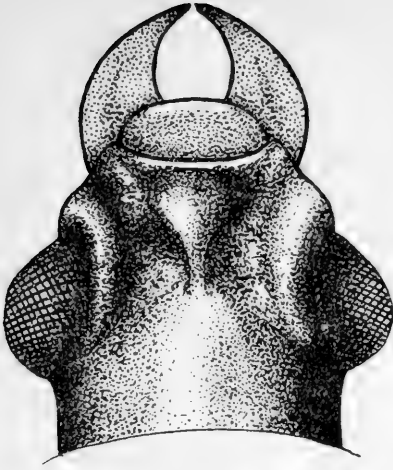
9th JUNE 1954.

The PRESIDENT in the Chair.

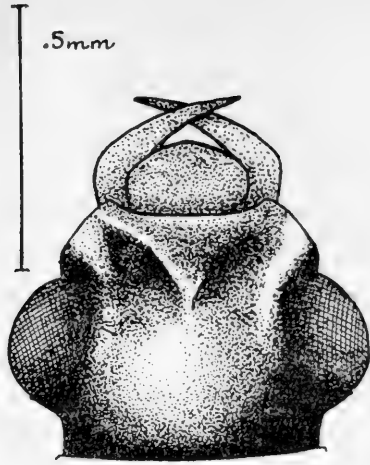
## EXHIBITS.

Mr. D. THORPE-YOUNG—Typical and black larvae of *Lasiocampa quercus* L. ab. *olivaceo-fasciata* Cekne. bred from ova laid last October.

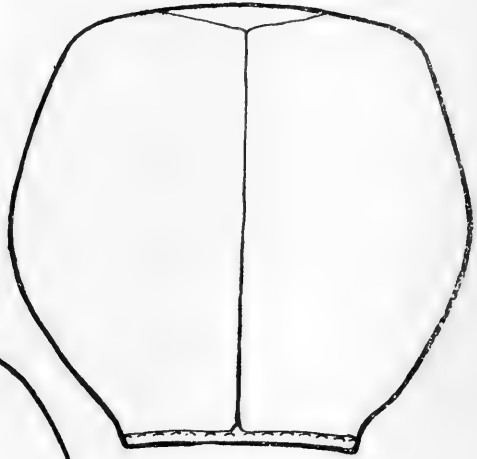
Mr. F. D. BUCK—The following coleoptera: (1) *Hedobia imperialis* L. beaten from dead twigs in Monks Wood, Hunts., 29/5/54; (2) *Orchesia minor* Walk. beaten from Ash on which very small *Daldinia concentrica* Ces. & de Nat. were growing; and (3) series of both *Dyschirius ludersi* Wagn. and *D. aeneus* Dej. He showed the accompanying figures on the epidiascope and drew attention to the differences between the species, some of which had been used by Dr. K. G. Blair (1933, *Ent. mon. Mag.*



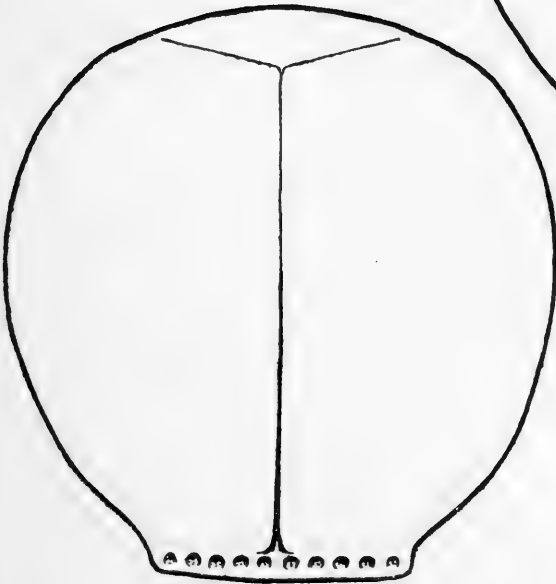
LUDERSI WAGN.



AENEUS (DEJ.)



AENEUS (DEJ.)



LUDERSI WAGN.



69: 151) when he placed *D. ludersi* on the British list. These differences may be summarised as follows:—

*D. ludersi*

The raised clypeal area is rounded at the sides and produced in a carina onto the inter-ocular area of the head.

Head elongate.

Prothorax globular, evenly rounded at the sides, anterior angles absent.

Line of punctures on the basal margin of the prothorax large and widely spaced.

*D. aeneus*

The raised clypeal area with straight sides, not extending onto the inter-ocular of the head at all.

Head quadrate.

Prothorax with noticeable anterior angles from which the sides are only slightly arcuately widened to behind the middle, then strongly arcuately contracted to the base.

Line of punctures on the basal margin of the prothorax smaller and more closely spaced.

The localities of the specimens exhibited were:—*D. ludersi*, Canvey Island, Essex, Deal, Kent and Monks Wood, Hunts.; *D. aeneus*, Luccombe Chine, I.o.W.

Mr. S. WAKELY—Larvae of the following Lepidoptera: (1) *Eclip-topera silacea* Schiff. from a Banstead female; (2) *Euphyia luctuata* Schiff. from a Kent female; (3) *Bapta distinctata* H.-S. (*pictaria* auctt.) from an Effingham female. He mentioned that the last-named could be easily mistaken for *Theria rupicaprararia* Schiff. at the first glance.

Dr. J. L. NEWTON—Two larvae of *Apatura iris* L. beaten from *Salix caprea* L. in Tilgate Forest, Sussex, 30th May 1954.

#### COMMUNICATIONS.

*Calophasia lunula* Hufn. had been taken in a house at Eastbourne, Sussex, on May 28th 1954.

Mr. R. V. HARRIS read a paper, illustrated by the lantern, on "Termites".

Mr. J. D. BRADLEY showed coloured photographs taken in the neighbourhood of Sydney, New South Wales, and on Lord Howe Island, Norfolk Island, New Hebrides and Saint Christopher.

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23rd JUNE 1954.

The PRESIDENT in the Chair.

The death of Mr. T. L. Barnett was announced.

#### EXHIBITS.

BARON DE WORMS—Larvae of the following Lepidoptera:—*Chaonia ruficornis* Hufn., *Pheosia gnoma* F. and *Drepana lacertinaria* L.

Mr. K. A. SPENCER—Examples of attacks by predators on leaf-mining larvae of Diptera (Agromyzidae):—(1) *Phytagromyza similis*

Bri. pecked by a bird from a leaf of *Knaulia arvensis* (L.) Coult. (Dipsacaceae), Box Hill, Surrey, and (2) *Agromyza orobi* Hend. taken, probably by an ant, from a leaf of *Lathyrus vernus* Wimmer (Papilionaceae), near Geneva, Switzerland.

Dr. B. P. MOORE—A number of Coleoptera from the French Mediterranean coast, including a living example of the large fossorial Carabid *Scarites buparius* Forst.

Mr. T. R. EAGLES—Leaves of the Ranunculaceous plants *Aquilegia vulgaris* L. and *Thalictrum aquilegifolium* L. mined by the larvae of the Agromyzid *Phytomyza minuscula* Gour.

#### COMMUNICATIONS.

*Vanessa cardui* L. had been seen on 23rd June at Wimbledon, Surrey.

Mr. D. LESTON reported that tests had shown male *Piezodorus lituratus* F. (Hem., Pentatomidae) to stridulate and that stridulation played a major part in its courtship behaviour. He announced the discovery of stridulation in Lygaeidae (Hem.); both sexes of species belonging to the genera *Kleidocerys* Steph. and *Scolopostethus* Fieb. stridulate and sound plays a part in behaviour leading to the formation of heterosexual aggregations.

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14th JULY 1954.

Mr. F. STANLEY-SMITH, Vice-President, in the Chair.

#### EXHIBITS.

Mr. H. D. SWAIN—An aberration of *Mimas tiliae* L. taken in his mercury-vapour light trap, 27th May 1954, at Putney, London, S.W.15. He read the following note: "This insect is unusual in that the spots on the forewings are almost entirely suppressed. The costal spot is outlined in greenish, but the central area of the spot is very pale yellowish green. The outer area is pale next to the margin and much darker next to the spots. The hindwings are decidedly melanic but are pale on the inner area, and the ends of the veins are marked with pale colour."

Mr. R. ELDON ELLISON—Lepidoptera taken recently at Eastbourne, Sussex: (1) A halved gynandromorph of *Polyommatus icarus* L. with the right side ♂ and the left ♀; (2) A heavily striated specimen of *Lysandra bellargus* Rott.; (3) Four series of *Agrotis puta* Hb. showing for each sex the differences between the Spring and Summer broods; (4) An extreme melanic example of *Agrotis segetum* Schiff.

Mr. F. D. BUCK—Coleoptera, (1) A series of *Plateumaris braccata* Scop.; (2) A series of *Donacia cinerea* Herbst; (3) A series of *D. clavipes* F., all from Sutton Broad, E. Norfolk, 4th July 1954, from a thick belt of reed at the edge of the Broad; and (4) a single specimen of *Rugilus fragilis* Grav. shaken from reed bundles on the edge of Hickling Broad, E. Norfolk, 5th July 1954; in all, three specimens were taken in this way.

Mr. A. W. GOULD—*Staphylinus pedator* Grav. taken at the Field Meeting at Faversham, Kent, 27th June 1954.

Dr. G. V. BULL—A mottled aberration of *Leucania lithargyria* Esp. from Sandhurst, Kent.

Mr. C. N. HAWKINS—Galls on *Forsythia* sp. found recently by Mrs. Blair at Seale, near Farnham, Surrey. He read a note on these. So far he had been unable to trace any record of *Eriophyes* mites causing galls on this shrub. A member suggested they might be aerial roots.

#### COMMUNICATIONS.

A member reported having had difficulty in rearing the larva of *Calophasia lunula* Hufn. After making a cocoon the larva left it and died. This was thought to be due to lack of moisture.

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28th JULY 1954.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. R. ELTON ELLISON—A series of *Hepialus lupulinus* L. from Eastbourne showing great individual variation in both sexes, with short series from Somerset, Surrey and Kent for comparison.

Dr. B. P. MOORE—Specimens of the brilliant metallic-blue chafer *Hoplia caerulea* Drury from the French Mediterranean coast.

Mr. A. E. GARDNER—Imagines of the following Odonata:—(1) *Oxygastra curtisii* Dale ♂ and *Cordulegaster boltonii* Don. ♀ and ♂, all from Hampshire, 18.vii.1954; (2) *Sympetrum nigrifemur* Selys, a ♂ bred from nymphs collected at Skelbo, Sutherland, 1.vii.1954, by Mr. L. Christie. See report of Royal Ent. Soc. meeting of 1.xii.1954 in *Proc. R. ent. Soc. London (C.)*, 19, 45.

#### COMMUNICATIONS.

Mr. J. O. T. HOWARD recorded that 4 specimens of *Heterogenea asella* Schiff. had been taken at mercury vapour lamp in a beech wood at Marlow 2½ weeks ago between 1.30 and 2.30 a.m., B.S.T., suggesting that this insect flies late.

Mr. T. G. HOWARTH read excerpts from a separate by Mr. Morell of Singapore University describing the larval habits of some Nymphaline butterflies.

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11th AUGUST 1954.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. A. H. SPERRING—Contrasted series of *Setina irrorella* L. from Surrey and Hants. He drew attention to the similarity of Surrey males to Hants. females and to the differences between Surrey and Hants. males.

Dr. B. P. MOORE—Two species of Ascalaphidae (Neuropt.) from the South of France, *Ascalaphus conajus* V.W. and *A. longicornis* L.

Mr. F. RUMSEY—Larvae of *Deuteronomos alniaria* L. bred from ova laid by a female taken at light at Banstead, Surrey.

Mr. F. T. VALLINS—Larva of *Celerio hippophaes* Esper feeding on Sea Buckthorn, *Hippophae rhamnoides* L. (Elaeagnaceae) from L'Argentière. (H.-A.) S.E. France.

Mr. T. R. EAGLES—(1) Larvae of *Dypterygia scabriuscula* L. from Enfield, Middlesex; (2) Fruiting spray of *Hippophae rhamnoides* L. from the North Norfolk sandhills.

#### COMMUNICATIONS.

Mr. C. N. HAWKINS drew attention to an account in "The Times" newspaper (10th August 1954) of a pair of xanthochroic wood warblers.

Mr. F. T. VALLINS and two other members had used a mercury vapour lamp on the Eastern slopes of Mount Skiddaw, Cumberland, in the hope of attracting *Amathes alpicola* Zett. It had been taken there four years ago. On this occasion they had no success.

Mr. K. A. SPENCER had taken *Liriomyza violiphaga* Hend. (Dipt., Agromyzidae) at Ham Street, Kent.

The SECRETARY read a paper by Mr. E. E. Syms, illustrated by lantern slides, on Centipedes and Millipedes.

25th AUGUST 1954.

The PRESIDENT in the Chair.

It was announced that Dr. E. A. Cockayne had been awarded the O.B.E.

#### EXHIBITS.

The PRESIDENT—*Argyresthia laevigatella* H.-S., which is probably the "micro" responsible for the extensive damage to larch trees in Switzerland and South France mentioned by members at the meeting of 11th August. He also showed figures of its life history from Dr. Beirne's paper of August 1945 in the Economic Proceedings of the Royal Dublin Society (Vol. III, No. ii).

Mr. L. CHRISTIE—Ova of *Calophasia lunula* Hufn. from 2nd. gen. ♀ ex Crumbles, Sussex, stock.

Mr. A. H. SPERRING—(1) Larva and pupa of *Earias clorana* L. and (2) Larvae of *Gonodontis bidentata* Clerck, all from South Hants.

Mr. G. C. D. GRIFFITHS—Three additions to the British List of Agromyzidae (Dipt.), on which he read notes:—“(1) *Liriomyza polygalae* Hering. A single mine was taken by Mr. Rumsey at Boxhill, Surrey, on the 2nd August 1953, and given to me. The fly emerged on the 16th. Host-plant: *Polygala* sp. (2) *Phytagromyza populivora* Hendel. Larval and Pupal stage taken in great abundance at Boxhill on the 11th October 1953. Flies emerged from the 7th March to 12th May. Host-plant: *Populus nigra* L. This species is distinguished from *P. populi* Kaltenbach, the previously recorded species off this plant, by remaining inside the leaf during the pupal stage, and by the darker coloration of the

pupa. I have included for comparison an adult specimen of *populi*. It can easily be seen with the naked eye that this specimen is almost entirely yellow, while the *populivora* are much darker. (3) *Phytomyza fulgens* Hendel. Larva taken at Boxhill on the 11th October 1953. Fly emerged 20th May. Host-plant: *Clematis vitalba* L. This is only the second time this species has been bred and it is apparently extremely rare”.

BARON DE WORMS—A living specimen of *Eulia formosana* Geyer from Woking, Surrey.

Mr. T. J. HONEYBOURNE—Set specimens of moths from South America and Sudan. Living larvae of *Apatele leporina* L. and *Moma alpium* Osbeck.

Mr. A. W. GOULD—Coleoptera from High Halstow, Kent, taken in July and August 1954:—*Silis ruficollis* F., *Malachius marginellus* Oliv., *M. viridis* F., *M. vulneratus* Abeille and *Anthocomus rufus* Herbst.

Mr. J. FINCHAM-TURNER—A spray of Blackberry with a double flower, on which the following report was subsequently received from Mr. J. E. Lousley, Hon. Gen. Sec. of the Botanical Society of the British Isles:—“The Blackberry is *Rubus ulmifolius* Schott. var. *bellidiflorus* (Kirchn.) Voss f. It is a double-flowered sport of a common European species and has been known in cultivation since 1864. I suspect that it arose once naturally and that all the plants now known have been propagated by cuttings by nurserymen. It is certainly very ornamental. It is very unlikely to be truly wild and perhaps it was planted years ago in the place where you found it. Once established there is no reason why it should not compete successfully with native brambles”.

Mr. R. TUBBS—A specimen of *Acraea egina* Cr. imported with bananas from the Cameroons. It was found alive at Newcastle, Staffs., and its immaculate condition and brilliant colouring point to its importation as a pupa.

Mr. T. R. EAGLES—Foliage of *Tilia cordata* Mill. from Crawley, Sussex.

#### COMMUNICATIONS.

BARON DE WORMS gave an account of a collecting expedition to the Burren of Clare, Republic of Ireland.

Mr. E. W. CLASSEY had taken at light at Bedfont, Middlesex, specimens of *Melanchra persicariae* L. ab. *ochrorenis* Kard.

Canon T. G. EDWARDS had taken *Sterrhia vulpinaria* H.-S. (*rusticata* Schiff. auctt. nec Schiff.) at Dulwich, London, S.E.

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8th SEPTEMBER 1954.

The PRESIDENT in the Chair.

#### EXHIBITS.

The SECRETARY, on behalf of Mr. S. C. S. BROWN—A collection of British Ants with their Coleopterous and Hymenopterous guests.

Mr. S. WAKELY—(1) Three Hemiptera taken at the Riddlesdown Field Meeting on 4th September, namely *Picromerus bidens* L., *Nabis apterus* F. and *Phytocoris varipes* Boh; (2) a specimen of *Coleophora clypeiferella* Hoffm. taken at Camberwell, London, S.E., at mercury vapour light on 11th August 1953, the first record for Britain. The larva feeds on *Chenopodium*; (3) an unidentified Tortrix moth taken at light at Camberwell on 4th August of this year.

Mr. G. C. D. GRIFFITHS—Two species of Agromyzidae (Dipt). new to the British List:—(1) *Phytomyza pimpinellae* Hend. from Mill Hill, Middlesex, 21st July 1954, emerged 7th August. It forms a blotch mine on *Pimpinella major* (L.) Huds. (Umbelliferae); (2) *P. campanulae* Hend., from the Boxhill Field Meeting, 8th August. Flies emerged 28th-29th August. Food plant: *Campanula glomerata* L. (Campanulaceae).

Mr. T. J. HONEYBOURNE—(1) Living larvae *Habrosyne pyritoides* Hufn. (*derasa* L.), some in the second instar and others almost full fed; (2) foliage of *Acer negundo* L. (the North American Black Maple) and of *Liquidambar styraciflua* L. (N. American Sweet Gum), both being food plants of some American Lepidopterous larvae.

Mr. M. HARRISON-GRAY—Living imagines of *Syntomis chrysozoma* Hampson (Lep., Syntomidae) from Nakuru, Kenya, East Africa.

Mr. and Mrs. T. G. HOWARTH—Larvae of *Pheosia tremula* Clerck bred from a female taken at mercury vapour light at Arkley, Herts.

Mr. A. E. GARDNER—Orthoptera: A pair of *Conocephalus dorsalis* Latr. from a weedy dyke at Bracklesham Bay, Sussex, 27th August, and two female *Meconema thalassina* Deg. swept from hazel in the Chichester district, 28th August 1954.

#### COMMUNICATIONS.

Mr. E. W. CLASSEY reported that the moth *Lithomoia solidaginis* Hb. had recently been taken at light in many places in Southern England. They were thought to be immigrants from the Continent.

The SECRETARY read on behalf of Mr. S. C. S. BROWN a paper on "The Guests of British Ants". (See *Trans.*)

22nd SEPTEMBER 1954.

The PRESIDENT in the Chair.

Mr. John Heath was declared elected a member.

#### EXHIBITS.

BARON DE WORMS—Twelve species of Lepidopterous larvae taken near Newtonmore, Inverness-shire, September 1954:—*Phragmatobia fuliginosa* L., *Apatele leporina* L., *Hydriomena ruberata* Frey., *Gonodontis bidentata* Clerck, *Tethea duplaris* L., *Notodonta ziczac* L., *N. dromedarius* L., *Pheosia gnoma* F., *P. tremula* Clerck, *Lophopteryx capucina* L., *Harpyia furcula* Clerck and *Drepana lacertinaria* L.

Mr. S. WAKELY—(a) A series of *Hydriomena furcata* Thunb. bred from larvae found on *Vaccinium myrtillus* L., Cheshire; (b) A larva of *Perizoma alchemillata* L. taken on *Galeopsis tetrahit* agg. at the recent field meeting at Westerham; (c) Specimens of the Coleoptera *Necrophorus vespilloides* Herbst and *Ontholestes tessellatus* Geoff. taken at the same meeting; (d) A cocoon, believed to be that of *Celama confusalis* H.-S., spun on a stem.

Dr. G. V. BULL—A bred specimen of *Hemaris fuciformis* L. with scales on the whole surface of the wings. Most of these are cast as soon as the insect flies.

Mr. J. L. HENDERSON—A teratological example of the beetle, *Agabus nebulosus* Förster from Wicken Fen, 9.ix.1954. The middle joint (6th) of the left antenna was of normal length and thickness but was widened out externally, with two small extra joints, one much smaller than the other, growing out from about the centre of the side. He showed an enlarged drawing by means of the epidiascope.

Dr. B. P. MOORE—Bred adults and larval exuviae of *Anthrenus pimplinellae* F. (Col., Dermestidae).

Mr. D. P. L. MATTHEWS—An aberration of *Polygonia c-album* L. with the hind wings deeply suffused with black, Theale, Berks., 19th July 1954.

Mr. F. D. BUCK—A series of *Agonum thoreyi* Dej. (Col., Carabidae) from Wheatear Fen, Surlingham, Norfolk, 16.viii.54. All were of the variety *puellus* Dej. He read the following note, which he illustrated by the epidiascope:—"This form of *A. thoreyi* is not so easily distinguished because the coloration difference so often drawn does not apply, neither are the tarsal furrows entirely reliable because there is a tendency for these to appear on other species within the sub-genus *Europhilus*. The safest character to use is that of the shape of the prothorax which is very little wider than long (not quadrate), whereas the other species have the prothorax distinctly wider than long. *Agonum gracile* Gyll. is perhaps the least transverse of the other species but this has the basal angles much more rounded and is broadest at the middle, whereas *A. thoreyi* is broadest in front of the middle".

Mr. R. M. MERE—A specimen of *Hydraecia hucherardi* Mabilie taken recently in South East England which he presented to the Society.

Mr. T. R. EAGLES—Foliage and flowers of the hardy climbing plant *Vincetoxicum officinale* Moench. (Asclepiadaceae). He suggested it might be of service as a food plant for exotic insects.

#### COMMUNICATIONS.

Mr. E. W. CLASSEY reported details of a number of captures of *Hydraecia hucherardi* Mabilie during the years 1952, 1953 and 1954 in various localities in Kent and Sussex. It was always in small numbers but he felt convinced that it was breeding here. Mr. C. N. HAWKINS had noted the Syrphid fly *Volucella zonaria* Poda in his house at Wimbledon, Surrey, 29th August 1954.



13th OCTOBER 1954.

The PRESIDENT in the Chair.

## EXHIBITS.

Mr. K. A. SPENCER—Mines of two *Liriomyza* spp. (Dipt., Agromyzidae) on *Tragopogon pratensis* L. (Compositae): (A) *L. pusio* Meig.; (B) *L. groschkei* sp. nov. found at Neuffen, Wurttemberg on 29th August 1954. A fly emerged 19th September 1954.

Mr. D. LESTON—*Blepharidopterus brevicornis* Wagn., a Mirid (Hem.) new to Britain. A single male was taken at the Box Hill field meeting, 12th September 1954. It is separable from *B. angulatus* (Fallen) on its much shorter 1st and 2nd antennal segments, but further work is in progress in order to see if this alleged difference is of inter-specific validity.

Mr. J. O. T. HOWARD—An aberrant cocoon of *Lasiocampa trifolii* Schiff., almost flat and quite open, with the perfect female imago which resulted from an unexpectedly successful pupation and emergence.

Mr. L. PARMENTER—(1) *Belvosia smithi* Fldr. (Dipt., Tachinidae), an imago bred by Mr. W. J. B. Crotch from an imported pupa of *Automeris saturata* Wkr. (Lep., Saturniidae); (2) *Symphoromyia crassicornis* Panz. (Dipt., Rhagionidae) taken at Tongue, Sutherland, 23rd June 1951, by Mr. L. Christie; (3) *S. immaculata* Meig., Coulsdon, Surrey.

## COMMUNICATION.

Dr. H. E. HINTON read a paper, illustrated by the lantern, on "The Sex-attractant Glands of the Lepidoptera and the Organs that play a part in Disseminating the Sex-attractant Substance".

30 OCTOBER 1954.

## THE ANNUAL EXHIBITION—RECORD OF EXHIBITS.

The President, Mr. S. N. A. Jacobs, opened the Exhibition at 2.30 p.m. in the Libraries of The Royal Society and of the Geological Society of London at Burlington House, Piccadilly, and thanked those two Societies on behalf of our Members for again lending us their splendid rooms for the occasion. He welcomed the large company of Members and visitors, and thanked the Exhibitors for their skill and care in preparing their many interesting exhibits.

The recorded attendance was 340 and there were 103 exhibits. Diptera and Hymenoptera were the orders chosen for special attention. As will be seen from the detailed reports the Lepidopterists brought many fine exhibits of new and rare species and varieties from their collections. In addition there was an imposing selection of Lepidoptera from the Rothschild-Cockayne-Kettlewell collection at Tring. Instructive exhibits were staged by the Ministry of Agriculture and Fisheries and by the Zoological Society of London.

Mr. C. F. ASTBURY—A selection of British lepidoptera showing migrants, some of the lesser common, and varieties of the more common



moths, taken in a Robinson Light Trap, placed 25 feet above ground level at Hastings (except where otherwise stated), during the last four years, viz. June 1950 to June 1954. *Drymonia dodonaea* Schiff. (*trimacula* Esp.), *Chaonia ruficornis* Hufn., *Odontosia carmelita* Esp., *Notodonta anceps* Goeze, *Tethea ocularis* L., *T.* or Schiff., *T. fluctuosa* Hb., *Polyplocia ridens* Fab., *Leucoma salicis* L., *Nola cucullatella* L., *N. strigula* Schiff., *N. albula* Schiff., *Celama confusalis* H.-S., *Spilosoma urticae* Esp., *Atolmis rubricollis* L., *Lithosia quadra* L., *Eilema sororcula* Hufn., *Apatele alni* L., *Actebia praecox* L., *Lampra fimbriata* Schreber, *Hadena lepida* Esp., *Leucania unipuncta* Haw., *L. vitellina* Hb., *L. albipuncta* Schiff., *Meristis trigrammica* Hufn., *Orthosia gothica* L., *Lithophane semibrunnea* Haw., *L. socia* Rott., *Cucullia asteris* Schiff., *C. chamomillae* Schiff., *C. gnaphalii* Hb., *C. absinthii* L. (Worcs.), *Pyrrhia umbra* Hufn., *Heliothis peltigera* Schiff., *H. armigera* Hb., *Eublemma parva* Hb., *Plusia ni* Hb., *P. gamma* L., *Biston betularia* L., *Crocallis elinguaris* L., *Acherontia atropos* L., *Herse convolvuli* L. and *Calophasia lunula* Hufn.

Mr. B. R. BAKER—(1) Examples of British Trichoptera, from Reading and District. 41 different species, viz., *Phryganea grandis* L., *P. striata* L., *P. varia* Fab., *Colpotaulius incisus* Curt., *Grammotaulius strigosus* Curt. (*atomarius* Fab. nec Gmel.), *Glyptotaelius pellucidus* Retz., *Limnephilus rhombicus* L., *L. marmoratus* Curt., *L. flavicornis* Fab., *L. lunatus* Curt., *L. politus* McLach., *L. vittatus* Fab., *L. sparsus* Curt., *Anabolia nervosa* Curt., *Stenophylax stellatus* Curt., *S. permittus* McLach., *Micropterna sequax* McLach., *Halesus radiatus* Curt., *Sericostoma personatum* Spence, *Notidobia ciliaris* L., *Goera pilosa* Fab., *Molanna angustata* Curt., *Athripsodes nigronevrosus* Retz., *A. fulvus* Ramb., *A. aterrimus* Steph., *A. cinereus* Curt., *A. dissimilis* Steph., *Mystacides azurea* L., *M. longicornis* L., *Triaenodes conspersa* Ramb., *T. bicolor* Curt., *Oecetis ochracea* Curt., *O. furva* Ramb., *Hydropsyche pellucidula* Curt., *H. ornatula* McLach., *H. angustipennis* Curt., *H. instabilis* Curt., *H. guttata* Pict., *Polycentropus flavomaculatus* Pict., *Psychomyia pusilla* Fab. and *Rhyacophila dorsalis* Curt. (2) Examples of Lepidoptera taken by a mercury vapour trap operating at Tilehurst, within the Borough of Reading. Distinctions were drawn between the seasons 1952 to 1954 inclusive, viz.:—(a) SPECIES NOTED ONLY IN 1952 AND 1953—*Heliothis virescens* Hufn. (*dipsacea* L.). (b) SPECIES NOTED ONLY IN 1953—*Herse convolvuli* L., *Leucoma salicis* L., *Oria musculosa* Hb., *Phalaena typica* L., *Lygephila pastinum* Treits., *Heliothis peltigera* Schiff., *Plusia festucae* L. (c) SPECIES NOTED ONLY IN 1954—*Tethea duplaris* L., *Lycophotia varia* Vill., *Plusia chryson* Esp. (d) SPECIES PRESENT 1952-53-54—*Hyloicus pinastri* L., *Deilephila porcellus* L., *Drymonia dodonaea* Schiff. (*trimacula* Esp.), *Clostera curtula* L., *Drepana binaria* Hufn., *Apatele leporina* L., *A. aceris* L., *Euxoa tritici* L., *Agrotis clavis* Hufn., *A. exclamatoris* L., *Polia nitens* Haw., *Antitype flavicincta* Schiff., *Rhizedra lutea* Hb., *Gortyna flavago* Schiff., *Eremobia ochroleuca* Schiff., *Cosmia affinis* L., *L. pyralina* Schiff., *Plusia gamma* L., *Melantheria procellata* Schiff. and *Eulia formosana* Geyer.

Mr. J. V. BANNER—*Apatura iris* L. A large female bred from larva taken in Sussex. *Pyrgus malvae* L. ab. *taras* Berg. Taken in Sussex. Selection of *Lysandra coridon* Poda taken in Sussex. Two aberrations of *Maniola jurtina* L. *Pieris rapae* L. ab. *immaculata* Ckll. bred from a pupa taken in Brighton. *Aleis repandata* L. A small series bred from a female taken at Kinloch Rannoch with others from Hunts. and Sussex for comparison. *Callimorpha jacobaeae* L.—partially bleached hind wing. *Aphantopus hyperantus* L. ab. *arete* Müll., S. Herts. *Polyommatus icarus* Rott. ab. *bi-i-nigrum* B. & L. + *basijuncta* Tutt, Lewes Dist.

Mr. E. S. A. BAYNES—The following Irish lepidoptera:—Series of *Maniola jurtina* L. s.sp. *iernes* Graves, from Cos. Donegal, Sligo, Mayo, Galway, Clare and Wicklow, 1947 to 1952, including male albino from Lough Corrib, Co. Galway, 5 June 1950. Series of *Argynnis euphrosyne* L., taken in 1947 in the Burren, Co. Clare; the only known locality in Ireland. Bred specimens of *Euphydryas aurinia* Rott. s.sp. *praeclara* Kane, from Cos. Kildare and Cork, 1947 to 1954. *Polyommatus icarus* Rott., selected ♀♀ from Cos. Sligo, Clare, Kildare and Wicklow, 1947 to 1950. Short series of *Erynnis tages* L., from the Burren, Co. Clare, June 1949. This local race exhibits an unusually large amount of grey marking, and would seem to be a sub-species. *Tethea fluctuosa* Hb. and *T. duplaris* L. ab. *argentea* Tutt, from Killarney. *Leucodonta bicoloria* Schiff., bred in 1934 by Miss B. Donovan from larva beaten from birch at Killarney in the previous year. *Nonagria sparganii* Esp. bred from pupae obtained near Timoleague, Co. Cork, August 1951. *Leucania unipuncta* Haw., taken by D. J. O'Sullivan at Tory Island Lighthouse, Co. Donegal, 1st October 1951. *Selenia lunaria* Schiff. taken at mercury vapour light, Killarney, 13th June 1953. This is a scarce species in Ireland. A few selected specimens of *Cyenia mendica* Clerck s.sp. *rustica* Hb. from Glenageary, Co. Dublin, caught or bred between 1947 and 1954. *Setina irrorella* L. ♂♂ and ♀♀ from the Burren, Co. Clare, 1948 and 1949. *Eustrotia olivana* Schiff., from Killarney, 1947 to 1953. *Cosymbia albipunctata* Hufn. (*pendularia* Cl. auctt. nec Clerck) ab. *subroseata* Wdfd., bred from larva taken Sept. 1951 near Athy, Co. Kildare. A melanic variety of *Ematurga atomaria* L. with white sub-marginal band, bred from larva found on bog myrtle near Oughterade, Co. Galway. Emerged May 1953. *Aegeria scoliaeformis* Borkh., from Killarney, July 1947. Series of ♂ and ♀ *Selenia bilunaria* Esp. ab. *eblanaria* Baynes, including eight para-types. The origin of this aberration was a wild ♀ f. *juliaria* Haw. taken at Glenageary, Co. Dublin in 1947. Ab. *eblanaria* appeared among the 1948 spring brood bred from this female. Specimens of the subsequent summer brood were paired with normal specimens bred from English (Surrey) larvae. Ab. *eblanaria* reappeared in the following and subsequent years. The ♂ holotype and the ♀ allotype are at Tring (*Ent. Rec.*, 64: 5 and 6).

Mr. S. BEAUFAY—(1) Photographic life histories of Dragonfly *Anax imperator* Leach, and the following Lepidoptera, *Hyloicus pinastri* L., *Lycaena dispar batavus* Haw., *Colias hyale* L. and *C. calida* Verity.

(2) Colour transparencies of *Colias hyale* L. and larva *C. calida* Verity and larva and *Carterocephalus palaemon* Pall. and larva and pupa.

Mr. CECIL L. BELL—*Euphydryas aurinia* Rott., a long series bred 1954, from Gloucestershire stock, obtained wild, showing considerable variation in markings and ground colour.

Mr. C. S. H. BLATHWAYT—Some Lepidoptera taken during 1954:—*Erebia aethiops* Esp., specimens taken in Westmorland on 21st August; *Agrotis trux* Hb. (*lunigera* Steph.), specimens taken in North Devon and at Weston-super-Mare during July; *Ammogrotis lucerneae* L., specimens taken in North Devon in early July; *Hadena bombycina* Hufn. (*glauca* Hb.), a specimen taken at Weston-super-Mare in May; *H. barrettii* Doubl., a specimen taken in North Devon in early July; *H. conspersa* Schiff., a few specimens taken in North Devon in early July showing considerable variation; *Antitype xanthomista* Hb., specimens taken in North Devon in September; *Leucania vitellina* Hb., a specimen taken at Swanage on 25th September; *Cosymbia pendularia* Clerck (*orbicularia* Hb.), specimens taken in the New Forest in early June; *Lampropteryx otregiata* Metc., a specimen taken near Glastonbury in Somerset on 31st July; *Nycterosia obstipata* Fab. (*fluviata* Hb.), a specimen taken at Weston-super-Mare on 29th May.

Mr. A. D. BLAXILL—(1) *Catocala fraxini* L. Two bred from ova from Mr. A. H. Harbottle, Kent. Emerged 26th and 30th August 1954. *Apatura iris* L. Three ♂♂ and one ♀ from larvae collected in Surrey, August 1953, and hibernated during 1953-54 winter. *Maniola jurtina* L. Three highly coloured females, taken July 1953 in South Devon. *Colias croceus* Fourc. Two males taken 1st Sept. 1954, near Shaftesbury and exhibited for record purposes. Also a typical female and two ab. *helice* Hb. taken in Essex, 1947. *Lysandra coridon* Poda. Ab. *semi-syngrapha* Tutt, also a very small female. All from Royston, Herts. *Papilio machaon* L. Three females and two males bred from Norfolk larvae, 1954. (2) INSECTS FROM PERTHSHIRE, 1954—*Erebia aethiops* Esp., A series taken in Perthshire during the first week of August 1954, showing considerable variation both in males and females. *Coenonympha tullia* Müll. Four (three ♂♂ and one ♀) taken 5th August 1954, in Perthshire, showing unusual amount of marginal grey. *Plusia interrogationis* L. and *Entephria caesiata* Schiff. Four taken 5th August 1954 at about 2,000 ft. in Perthshire.

Mr. and Mrs. E. L. BOLTON—(1) *Pararge megera* L., male. Remarkable for obsolete markings on forewings. Captured, Sussex, 1953. (2) *P. aegeria* L., pathological example captured, Surrey, 1953, and a female with suffused areas, bred, Surrey, April 1954. (3) *Maniola jurtina* L., male with right forewing of different form from the left, and a male ab. *commaculo*, Leeds, 1954. (4) *Euphydryas aurinia* Rott., female with dark obsolete areas to the forewings, the outer band also being absent. Bred, Surrey, May 1954. (5) *Polyommatus icarus* Rott., female ab. *albopuncta* Tutt, dark lunules on both upper and undersides replaced by white spots, 1954, and a male ab. *obsoleta* Clark (Dark form), 1954. (6) The following *Lysandra coridon* Poda, aberrations;

UPPERSIDES: male, *post-fowleri* B. & L.; female, *fowleri* South; female, *glabrata* Tutt, wings of greasy appearance, and a male colour form possibly one of the *grisea* forms. UNDERSIDES: A remarkable male with dark brown borders obscuring the lunules, and a male with striking elongation to black bars of lunules. (7) *Erynnis tages* L., female, very pale brown, Sussex, May 1954.

Mr. S. R. BOWDEN—Living *Euchloë* (*Anthocharis*) *cardamines* L. (Lep., Pieridae), exhibited on Michaelmas daisies, etc. From Hertfordshire larvae reared in 1953; pupae stored at 1° C. from January 1954 to 8th October 1954. Male butterflies emerged 24.x, 26.x (two), 28.x (two), and 29.x; females emerged 30.x and 31.x. A third ♀ failed to emerge on 31.x after colouring.

Mr. R. F. BRETHERTON—(A) Butterflies collected around Kyrenia, Cyprus, 13th-19th May 1954. *Chazara briseis larnacana* Oberthur (with dimorphic females, the white form and the brown form (f. *pirata* Esp.) being about equally numerous), *Hipparchia syriaca cypriaca* Stdgr., *H. pellucida cypriensis* Holik, *Satyrus anthelea acamanthis* Rebel, *Pararge roxelana* Cr., *P. maera orientalis* Stdgr., *Maniola jurtina cypriicola* Stdgr., *Ypthima asterope* Klug, *Vanessa cardui* L., *Lycaena phlaeas* L., *Glaucopsyche paphos* Turner (endemic to Cyprus), *Polyommatus icarus* Rott., *Lampides boeticus* L., *Thymelicus actaeon* Rott., *Pieris brassicae cataleuca* Rober, *P. rapae* L., *Euchloë ausonia taurica* Rober, *Colias croceus* Fourcroy, *Gonepteryx cleopatra taurica* Stdgr. (B) Some British lepidoptera caught or bred in 1954:—*Phalera bucephala* L. ab. with silver scales lacking (Ottershaw, Surrey, at light, 5.vi.54); *Dasychira pudibunda* L.: melanic ab. (Ottershaw, at light, 29.v.54); *Eilema caniola* Hb. (Tintagel, N. Cornwall, 31.viii.54); *Apatele rumicis* L. ab. *salicis* Curtis (Ottershaw, at light, 1.vi.54); *Ammogrotis lucerneae* L. (Tintagel, 31.viii.54); *Calophasia lunula* Hufn.(2) bred 14.viii.54 from E. Kent larvae; *Amathes baja* Schiff.: ab. with apical spots missing and dark purple ground colour (Ottershaw, at light, 20.viii.54); *Mythymna turca* L., a pair, Ottershaw, at light, 10 and 18.vii.54; *Hada nana* Hufn.: melanic ab. (Ottershaw, at light, 20.vi.54); *Apamea remissa* Hb. (Ottershaw, at light, 9.vii.54); *Hydraecia paludis* Tutt (Ottershaw, at light, 8.viii.54); *Chloroclystis debiliata* Hb.(5) (Netley Heath, Surrey, 6 and 24.vii.54—a new county record); *Phigalia pilosaria* Schiff. (*pedaria* F.) ab. *monacharia* Stdgr. (Ottershaw, at light, 14.ii.54); *Dioryctria splendidella* H.-S. (Ottershaw, at light, 2.viii.54); *Crambus contaminellus* Hb. (3) (Ottershaw, at light, 28.vii. to 11.viii.54); *Platyptilia ochrodactyla* Schiff. (4) (Ottershaw, flying with many others among tansy at dusk, 2.viii.54).

Mr. G. A. BRETT on behalf of the Ministry of Agriculture and Fisheries—An exhibit intended, in the main, to show the attraction of rat and mouse baits for many of the stored products insects. These invaders of the baits include *Ephestia elutella* Hb. (Lep. Phycitidae); *Carpophilus dimidiatus* F. (Col. Nitidulidae); *Oryzaephilus surinamensis* L. (Col. Silvanidae), *Tenebrio molitor* L. (Col. Tenebrionidae); *Tribolium castaneum* Hbst. (Col. Tenebrionidae); *Blatta orientalis* L. (Orthoptera),

and some members of the Psocidae. Cultures and photographs of the above insects were also exhibited. Four species were shown in baits on actual rat bait trays. Mounted specimens of *Coelopa frigida* F., the Seaweed fly (Dipt. Coelopidae) and *Monomorium pharaonis* L. (Hym. Formicidae) were displayed for examination under a binocular microscope.

Mr. F. D. BUCK—The species of the *Agonum* sub-genus *Europhilus* Chaud., showing by means of line illustrations and a key alternative means of determination based on the form of the prosternal process and the mes-episterna.

Mr. BRUCE S. BURNS—Lepidoptera captured and bred during 1954. *Mimas tiliae* L., 1 female having all green markings replaced by chocolate brown. Bred 13th May from a pupa dug up from under a lime tree near Fareham, Hants. *Aphantopus hyperantus* L., 2 male ab. *arete* Müll., captured in a wood in S.E. Hants., within a few yards of each other on 24th July. *Maniola tithonus* L. (a) 1 female with pale central area to the right fore-wing, otherwise normal. Captured 28th August in S.E. Hants; (b) 1 male ab. *excessa* Leeds, with two quite large additional black spots beneath the apical spot on each forewing, the hindwings being normal. Captured at Swanage, Dorset, 22nd July. *Aglais urticae* L., 1 male with pale left hindwing. Bred 8th September, from a pupa collected with several others, in Gosport. *Euphydryas aurinia* Rott., 4 male aberrations from a colony in S.E. Hants.:—(a) 1 specimen with the central area of both forewings suffused with black, captured 30th May; (b) 1 specimen with the right forewing abnormally small, being about half the size of the left one. Captured 5th June; (c) 2 specimens captured 5th June with several black markings missing from both forewings.

Mr. P. J. BURTON—Lepidoptera:—(1) *Nola strigula* Schiff. ab., S. Wilts., July 1954 (Plate II, fig. 2). (2) *Xanthorhoë designata* Hufn. ab. *costimacula* Cockayne taken by Master A. Davidson, New Forest, September 1954. (3) *Nonagria neurica* Hb., Suffolk, July 1954, and reed showing pupa *in situ*. Bred from larva which showed adaptability when faced with unnatural conditions. The section of reed stood vertically with the open end at top through which the larva entered to pupate at the bottom, head up—the reverse of normal.

Mr. S. E. W. CARLIER—(I) Lepidoptera (a) *Samia cynthia* Drury form *pryeri* Butl.? (Saturniidae) caught during last week of August 1954 by Mr. R. W. Watson, F.R.E.S., at rest on a garden-fence at Shirley, Southampton. Probably came from Continent with shipping—or an escape from some unknown local breeder. (b) *Maniola jurtina* L. (Satyridae) ♂ with white patches on both fore and hind wings of left-side—from Worth, Isle of Purbeck, Dorset, on September 12th 1954. "There were several of these "bleached" specimens—of both sexes—mostly very worn". (c) *Hyloicus pinastri* L. (Sphingidae). Taken at rest, on Pine-trunk about one foot from the ground, between 3 and 4 p.m. on September 16th, 1954, in "Puckpits Inclosure", New Forest, Hants. Second brood or delayed emergence?. (II) Lepidoptera and Hymenoptera

(Parasitica):—A series of 11 moths (one albino) and 5 or 6 different species of Hymenopterous parasites bred from 27 feral larvae of *Ypsolophus parenthesellus* L. (*costellus* Fab.) (Plutellidae), beaten from hazel and oak in Austy Wood, nr. Bearley, Warwicks. on 19.vi.54. (These larvae were all in the last instar, and pupated within 5 days of capture). 9 parasites of, apparently, 3 species emerged between 16 and 24.vii.1954 and 241 of, probably, 3 species came from 6 pupae between 24 and 29.vii.1954. "The 11 moths emerged from 16 to 24.vii.1954. This is considerably earlier than the dates given in Ford's "Guide to the smaller British Lepidoptera" which is Aug./Sept. It is, however, in keeping with my previous experience of this moth in Warwickshire and Worcestershire. 7.viii.1920 (caught) Umberslade, Warw. 5.viii.1929 (caught) Wyre Forest, Worcs. 11.viii.1935 (caught) Wyre Forest, Worcs. 17.vii.1951 (bred) Austy Wood, Warw. With us, in the Birmingham area this species is always a month earlier than *Y. radiatellus* Don. which we seldom see before September". (III) Hymenoptera—Symphyta. Larva, cocoon and imago of *Trichiosoma* sp. ? (Cimbicidae), beaten from Birch bushes on Kinver Edge, S.W. Staffs., 15.ix.1953, the imago emerging 2.vi.1954. "5 larvae were obtained. All had a distinct black, white-edged, longitudinal dorsal line becoming indistinct or absent in the thoracic region".

Mr. J. M. CHALMERS-HUNT—The following Lepidoptera all taken or bred by him: *Aplasta ononaria* Fuessl. ab. *rubraria* Prout, Folkestone, Kent, 7th July 1951; *Colostygia pectinataria* Knoch ab. *constricta* Prout, Wollage Green, Dover, Kent, 23rd June 1952; *Mesoleuca albicillata* L. ab. *lacticolor* Lempke, 3 bred from eggs, West Wickham, Kent (second brood); *Anaitis plagiata* L. ab. *tangens* W. Fritsch, Ham Street, Kent, May 1950; *Scopula emutaria* Hb. ab. *subroseata* Haw., Faversham, Kent, 25th June 1952; *Cosymbia albipunctata* Hufn. ab. *subroseata* Wdfd., bred ab ovo, Bromley, Kent, 16th May 1949; *Aegeria (Synanthedon) culiciformis* L. ab. *flavocingulata* Spul., Broad Oak, near Canterbury, Kent, bred from pupa May 1950; *Cepphis advenaria* Hb. ab. *fulva* Gillmer, Westerham, Kent, 5th June 1949; *Semiothisa notata* L. ab. *uniformata* Lempke, Ham Street, June 1954; *Mitochondria miniata* Forst. ab. *crogea* Bigneau, Ham Street, 27th June 1952; *Earias clorana* L., a series bred June 1954 from larvae, Elmers End, Kent; *Calophasia lunula* Hufn., bred June 1954, from larvae, Pevensey, Sussex; *Heterogenea asella* Schiff., three, Ham Street, 1951; *Hadena compta* Schiff., short series bred 1954 from larvae, Dover; *Apatele rumicis* L. ab. *salicis* Curt., three, Ham Street, 20th-31st July 1951; *Xylota exsoleta* L., Dungeness, 24th September 1949, a very uncommon species in Kent; *Catocala promissa* Schiff., three, Ham Street, 20th-31st July 1951; *Phlogophora meticulosa* L. ab. *ignicula* Dannehl. Sandwich, 26th August 1950; *Amathes c-nigrum* L. ab. *rufa* Tutt, Ham Street, September 1949; *Aporophylla australis* Odv. ab. *ingenua* Frr., Dungeness, 24th September 1949; *Apamea ophiogramma* Esp., ab. *moerens* Stdgr., Westbere, Kent, 24th July 1946. *Pseudopanthera macularia* L., a ♀ aberration with first three costal



spots on forewing joined to form an irregular blotch; elsewhere markings on both wings much reduced, Folkestone, Kent, 27th June 1953. (Plate I, fig. 6).

Mr. L. CHRISTIE—(1) Neuroptera. Three specimens of *Psectra dip-tera* Burm. from Skelbo, Sutherland, Scotland. Found at base of reeds and grass on sand dunes. Unusual habitat, new county record. Date: 1.vii.1954. (2) Coleoptera. *Aphodius nitidulus* Fab. Taken at Little Ferry, Golspie, Sutherland, Scotland, 9.vii.1954. A new county record, normally taken in Midlands and S.E. England. (3) Lepidoptera. *Hydraecia hucherardi* Mab. A ♂ taken at mercury vapour light, 3.x.1953, S.E. Kent. A species recently added to the British List. *Calophasia lunula* Hufn. A ♂ and a ♀ bred from wild larvae found on Yellow Toadflax at The Crumbles, Eastbourne, Sussex, September 1953. Emerged: ♂ 21.vi.1954, ♀ 28.v.1954. Another recent addition to our fauna. *Pieris brassicae* L. Gynandromorph, left side ♀, right side ♂. Also empty pupa case. Bred from ovum laid by wild Sussex ♀. Emerged 2.vi.1954.

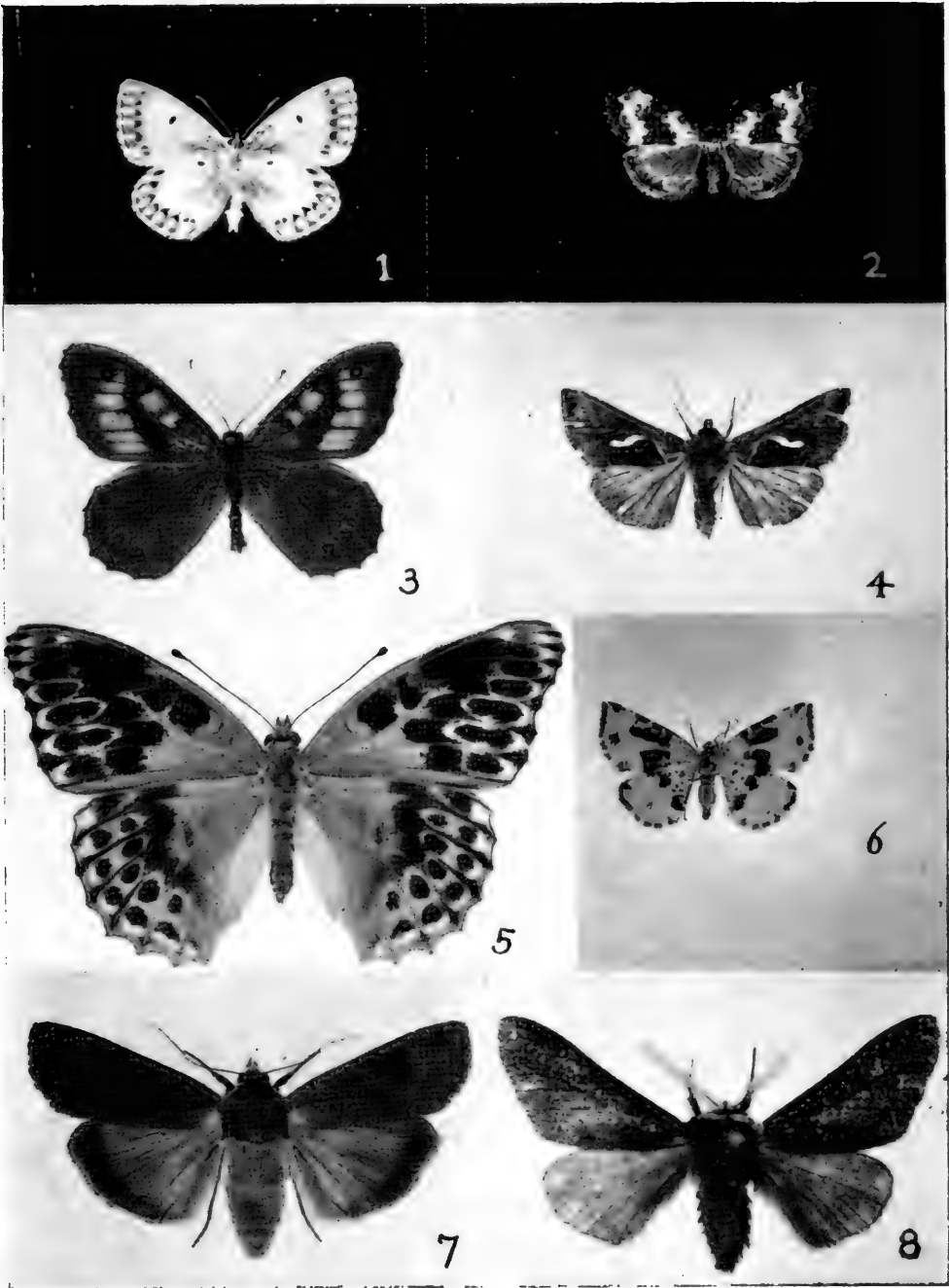
Mr. E. W. CLASSEY—See Dr. H. B. D. KETTLEWELL and Mr. A. L. GOODSON.

Major A. E. COLLIER—*Aphantopus hyperantus* L. ab. *lanceolata* Shipp, 5 ♂♂, 5 ♀♀, bred from Surrey stock in 1954, and a male underside with immaculate front wings from the above brood. *Maniola jurtina* L., an albino ♀ from South Downs, 1954; a ♀ underside ab. from Oundle, 1948; a ♂ upperside ab. *excessa* Leeds, Alice Holt, 1954. *Pararge megera* L., a banded ♂, Surrey, 1954. *Coenonympha pamphilus* L. ab. *obsoleta* Leeds, Hampshire, 1954. *Argynnis selene* Schiff., ♂ and ♀ abs. from Sussex, June 1954. *A. euphrosyne* L., a banded and a confluent ♂ abs., Sussex, 1954. *Lysandra coridon* Poda, ♀ ab. *alba-caeca* B. & L., ♂ ab. *marginata* Tutt, ♂ ab. *fowleri* South, all Wiltshire, August 1954. Two ♂♂ ab. *confluentiae* Courv. + *glomerata* Tutt, from Sussex, 1954. *Thecla betulae* L., ♀ ab. bred, Surrey, 1954. *Pyrgus malvae* L. ab. *taras* Berg., Sussex, 1954.

Mr. S. COXEY—The following Lepidoptera from (1) Hailsham and District, Sussex:—*Apatele alni* L., *Meristis trigrammica* Hufn. melanice and banded forms, *Tethea fluctuosa* Hb., *Dysstroma truncata* Hufn., a bred series 1954, *Euphyia luctuata* Schiff. a wild caught series, *Cosym-*

#### EXPLANATION OF PLATE I.

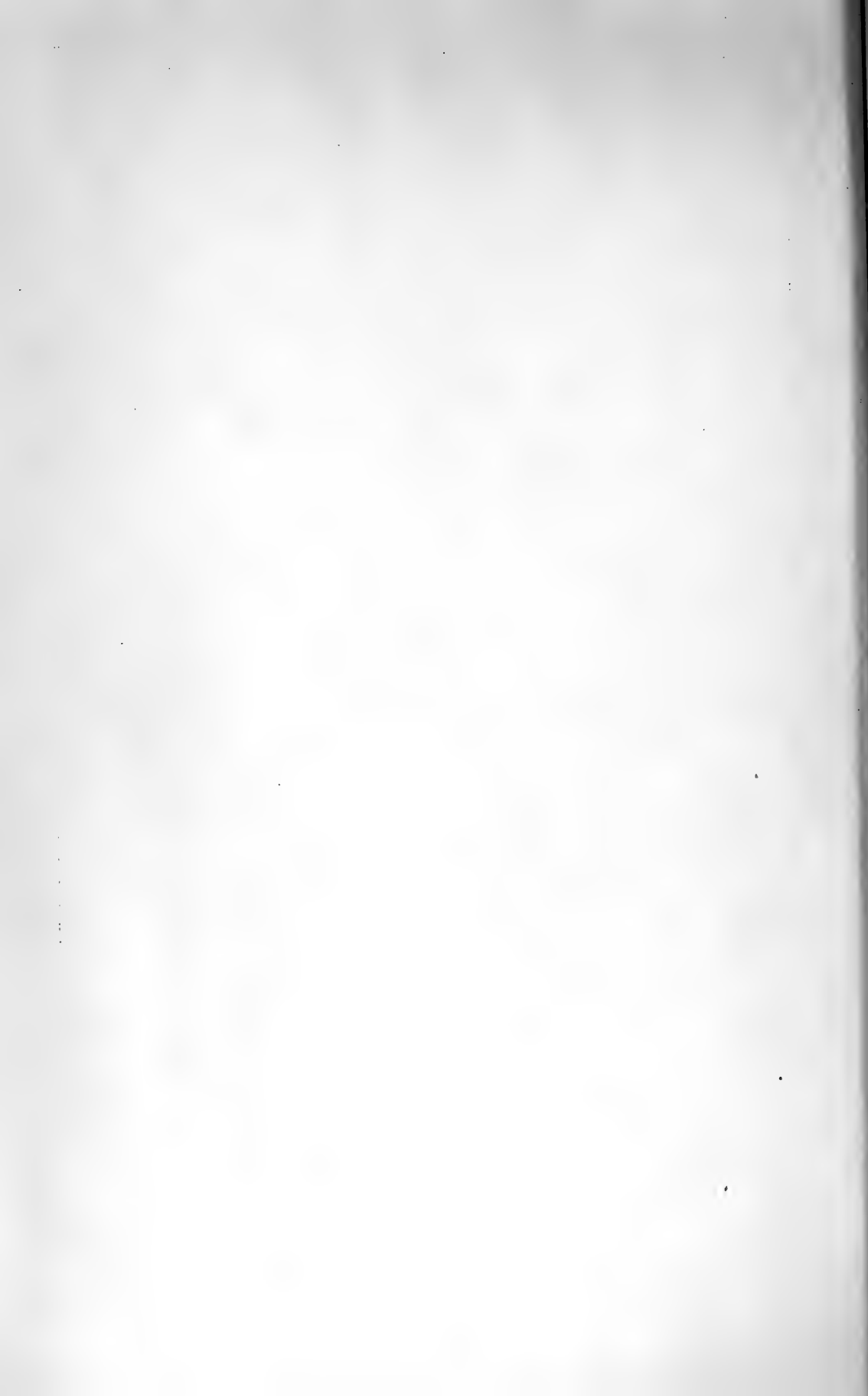
- Fig. 1. *Lysandra bellargus* Rott. ab. Mr. Ian Farwell.  
 Fig. 2. *Jaspida deceptor* Scop. Mr. E. J. Hare.  
 Fig. 3. *Pararge megera* L. ab. Mr. R. E. R. Parsons.  
 Fig. 4. *Plusia gutta* Guen. Mr. P. Cue.  
 Fig. 5. *Argynnis paphia* L. ab. (bred). Mr. G. B. Oliver.  
 Fig. 6. *Pseudopanthera macularia* L. ab. Mr. M. Chalmers-Hunt.  
 Fig. 7. *Triphaena pronuba* L. ab. *postnigra* Turner. Mr. A. L. Goodson.  
 Fig. 8. *Biston strataria* Hufn. ab. *robinaria* Frings. Mr. P. Cue.



Annual Exhibition : 30th October 1954.

*Photos. W. H. T. Tams*





*bia punctaria* L. bred 1954, *Hydriomena coerulea* Fab. (2) Formby, Lancs.:—*Harpyia furcula* Clerck, *Actebia praecox* L., *Euxoa tritici* L., *E. cursoria* Hufn., *Agrotis vestigialis* Hufn., *Perizoma albulata* Schiff., *H. coerulea* Fab. melanic (bred 1954) forms to contrast with the above mentioned typical ones from Sussex. (3) Burnt Wood, Staffs.:—*Semiothisa notata* L., *Bomolocha crassalis* Fab. (*fontis* Thunbg.), *Aethalura punctulata* Schiff. (4) Near Clitheroe, N. Lancs.:—*Amathes castanea* Esp. both grey and red forms, *A. glareosa* Esp. brown ground colour. (5) Westmorland:—*Orthosia miniosa* Schiff., *Venusia cambrica* Curt., *Perizoma taeniata* Steph. (6) Near Grassington, Yorks.:—*Perizoma minorata* Treits. (7) N. Wales:—*Amathes ashworthii* Doubld. a bred series 1954, *Trichopteryx carpinata* Borkh. a banded form. (8) Dorset:—*Cosymbia pendularia* Clerck (*orbicularia* Hb.) a bred series 1954. (9) Aviemore:—*Amathes alpicola* Zett. a bred series 1948. Also three Butterfly varieties not previously exhibited:—*Aphantopus hyperantus* L. ab. *lanceolata* Shipp, New Forest, 1936; *Maniola jurtina* L. ab. *cervinus* Frhk. similar to the one in Frohawk's *Varieties of British Butterflies*, Plate X, fig. 3, wild caught, Cherhill Downs, Wilts., 1944; *Nymphalis io* L. a partially "blind" ab., Eastbourne, 1938.

Mr G. F. COXON—*Colias croceus* Fourc., one normal female, and two ab. *helice* Hb., one primrose, the other cream, all taken on the same day, 5th August 1949, on Seaford Head, Sussex. *Maniola jurtina* L., a male with the right hind wing one third normal size, taken on the South Downs, Clayton, Sussex, 19th July 1954. *Euchloë cardamines* L., a gynandrous female with orange patch of male colour on under-side of right hind wing, taken at Kingswood, Surrey, 25th April 1950.

Mr P. CUE—(1) *Biston strataria* Hufn. ab. *robiniana* Frings, at light, 10th March (Plate I, fig. 8). (2) *Eupithecia insigniata* Hb., at light, 12th May. (3) *Plusia gutta* Guenée, found on a fence, 4th October (Plate I, fig. 4). All taken at Ashford, Kent, in 1954.

Mr R. P. DEMUTH—A drawer of lepidoptera caught in 1954 mostly in the Republic of Ireland. Insects included are *Harpyia bicuspis* Borkh. from Cannock; a series of *Stauropus fagi* L. from Killarney with specimens from Epping and Gloucester to show off the creamy ground colour and the large size of the Irish examples; a short series of *Chaonia ruficornis* Hufn. (*chaonia* Schiff.) from Killarney with two males with broad white bands; a series of *Notodonta dromedarius* L.) from Cannock. from Bucks. and from Killarney to show the large basic differences between this insect taken from three widely separate localities; an almost albino *Lophopteryx capucina* L. (*camelina* L.) from Denham, Bucks.; a series of pale silver grey *Tethea duplaris* L. from Killarney, where the insect is out in May, compared with a normal form from Ham Street and the melanic form from Cannock; *T. fluctuosa* Hb. from Killarney compared with the same species from Gloucester; a female *Drepana falcataria* L. from Cannock with its markings blurred and a *D. lacertinaria* L. from Killarney suffused on all four wings with grey; specimens of *Spilosoma lubricipeda* L. (*menthastri* Esp.) from Killarney with deep cream fore-wings, of *S. lutea* Hufn.

(*lubricipeda* L. auctt. nec L.) from Killarney in deeper buff and *Cyenia mendica* Clerck ab. *rustica* Hb. from Killarney all compared with the same species from Gloucester to emphasise the variation; a series of the large boldly marked *Colocasia coryli* L. from Killarney compared with the melanic forms from the Chilterns; a few *Apatele alni* L. from Killarney, indistinguishable from those from the South of England; some dark *Ammogrotis lucerneae* L. from Sleat Head, the most westerly point of Ireland; *Ceramica pisi* L. also from Sleat Head, compared with some darker, more suffused specimens from Cannock; *Hadena bombycina* Hufn. (*glaucæ* Hb.) from Killarney; *H. barrettii* Doubld. from the Waterford coast where it is very common and rather smaller than in Cornwall; *H. conspersa* Schiff. from Sleat Head exhibiting none of the striking variation often found in Cornwall and the far north; *H. caesia* Schiff. from Sleat Head and the Waterford coast, the latter larger and paler; *H. capsophila* Dup. from the same two localities, the Waterford ones again paler and more distinctly marked; a series of the striking purple form of *Heliothrips anceps* Schiff. (*saponariae* Bork.) ab. *hibernia* Cockayne from the Waterford coast compared with a standard English specimen; three specimens of *Xylomyges conspicillaris* L. from my garden at Hardwicke, Gloucestershire, an ab. *melaleuca* View. (which is extremely common in Gloucestershire) and a male and female of the typical form (which is very rare); a single specimen of *Hydraecia hucherardi* Mab. from Rye in Sussex and finally a specimen of *Cirrhia pallescens* Hb. also from Rye.

Mr. C. H. DIXON—Series of Lepidoptera bred in 1954:—*Epirrhoe rivata* Hb. from ova, 8.vii.53, Westerham. *Cosymbia pendularia* Clerck (*orbicularia* Hb.) from larvae, 4.ix.53, New Forest. *Euphyia cuculata* Hufn. from ova, 6.vii.53, Westerham. *E. luctuata* Schiff. from ova, 28.vii.53, Ham Street. *Ennomos autumnaria* Wernb. from ova, ix.53, Dartford. *Jodia croceago* Schiff. from ova, iv.54, Chiddingfold. *Dasyptolia templi* Thnb. from larvae, 22.vii.54, Unst. One *Apatele alni* L., 4.vi.54, Micheldever. One *Spilosoma lutea* Hufn. (*lubricipeda* auctt. nec L.) ab., 6.vi.54, Micheldever. Three *Heptamelus humuli* L. ab. *thulensis* Newman (*hethlandica* Stgr.), 17.vii.54, Unst.

Mr. R. C. DYSON—The following Lepidoptera:—(1) *Lysandra coridon* Poda, (a) A series of 16 males taken in Sussex and Wiltshire during 1954 showing border variation from ab. *fowleri* South to ab. *marginata* Tutt. (b) A male ab. *parvipuncta* Rebel. (c) A female ab. *confluens* Tutt. (d) Two females and one male ab. *obsoleta* Tutt. (e) A female ab. *infrasemisyngrapha* B. & L. without orange lunules. (2) *L. bellargus* Rott., (a) male underside with additional spotting and wedge shaped spots. (b) A gynandrous female (left hindwing). (3) *Pyrgus malvae* L., An ab. *taras* Meigen. (4) *Maniola jurtina* L., Two albinistic specimens, ♂ and ♀. (5) *Herse convolvuli* L., A male bred in a heated cage from a wild larvae. (6) *Arctia villica* L., A male ab. *confluens* Romanoff. (7) *Dasychira pudibunda* L., Two melanic males. (8) *Selenia tetralunaria* Hufn., A series bred during 1953 and 1954, five broods being obtained in under 12 months. F1 generation emerged

July 1953, F.2 generation emerged September 1953, F.3 generation emerged October 1953, F.4 generation emerged January 1954. The majority of each brood emerged as summer form and very few emerged in March and April 1954 as Spring brood. The F.3 generation summer form show considerable variation in size and colour. (9) *Euplagia quadripunctaria* Poda, a number of young larvae; ova obtained from a Devon female.

Mr. N. T. EASTON—Photographs of dark larvae, July 1954, from melanic female *Saturnia pavonia* L. (Lep., Saturniidae) (Burghfield, Berks.) paired with brother. Only 3 eggs were fertile. (1) Larva in penultimate instar. Almost entirely black. Irregular green spots on some segments. Spiracular line dull orange. This larva died before ecdysis. (2) Larva in last instar. Space between the black bands very darkly smoky green. Tubercles pink. Space between bands on rings 1-4 largely black. Spiracular line green. Head green. In the penultimate instar this larva was all black with orange (broken) spiracular line. In earlier instars larvae were black with only very slight flecks of green.

Mr. R. C. EDWARDS—(1) Series of *Ennomos autumnaria* Wernb., *Euphyia luctuata* Schiff. (including an ab., the only one among 50 bred, with white bar extending to outer margin) and *Euphyia cuculata* Hufn. bred from females taken in Kent in 1953. (2) The following lepidoptera from N. Shetlands, July 1954: *Xanthorhoë montanata* Schiff. ab. *shetlandica* Weir, *Entephria caesiata* Schiff., *Diarsia festiva* Schiff. ab. *thulei* Staud., *Hepialus humuli* L. ab. *thulensis* Newman, *Dasypolia templi* Thnb. (bred from larvae), *Apamea monoglypha* Hufn., *A. exulis* Lef. and *Perizoma albulata* Schiff. ab. *thules* Weir. (3) A dark ♀ *Discestra trifolii* Hufn. from a bombed site in the City of London, June 1954, with a specimen bred from it, the remainder of the pupae lying over the winter. (4) A series of *Eupithecia millefoliata* Rössler bred from larvae found September 1953, and living larvae of *Thalera fibrialis* Scop. bred from a ♀ taken August 1954, both species from Kent.

Mr. R. ELDON ELLISON—(1) 30 species of lepidoptera taken in Ireland, chiefly the Burren of Clare, 5th-19th August 1954, including series of *Calamia tridens* Hufn. (*virens* L.), *Apatele euphorbiae* F., *Aspitates gilvaria* F. s.sp. *burrenensis* Cockayne, *Colostygia salicata* Hb. and *Gnophos myrtillata* Thnbg., and specimens of *Eilema caniola* Hb. (the first Irish record since 1878), *Setina irrorella* L., *Ammagrotis lucerneae* L., *Agrotis trux* Hb. s.sp. *lunigera* Steph., *Apamea furva* Schiff. and *Eupithecia icterata* Vill. s.sp. *cognata* Steph. (2) Lepidoptera taken in England, chiefly Sussex and Kent, from November 1953 to October 1954, including *Polyommatus icarus* Rott. (a gynandromorph, right wings ♂, left wings ♀), *Lysandra bellargus* Rott. (a ♂ with strongly striated forewings and 2 ♀♀ suffused with blue), a series of *Calophasia lunula* Hufn. (one taken in Sussex, the rest bred from Kent larvae) and *Euphyia luctuata* Schiff., and aberrations of *Arctia caja* L., *A. villica* L., *Cryphia impar* Warren (from Gloucestershire), *Agrochola macilenta* Hb., *A. circellaris* Hufn., *Eupithecia tripunctaria* H.-S., and a very varied

series of *Hepialus lupulinus* L. (3) Two specimens of *Graptolitha lapidea* Hb. (of which there is only one previous British record) (Plate II, fig. 3), also *Leucania vitellina* Hb. (2) and *L. unipuncta* Haw (1), all taken at Eastbourne in 1954.

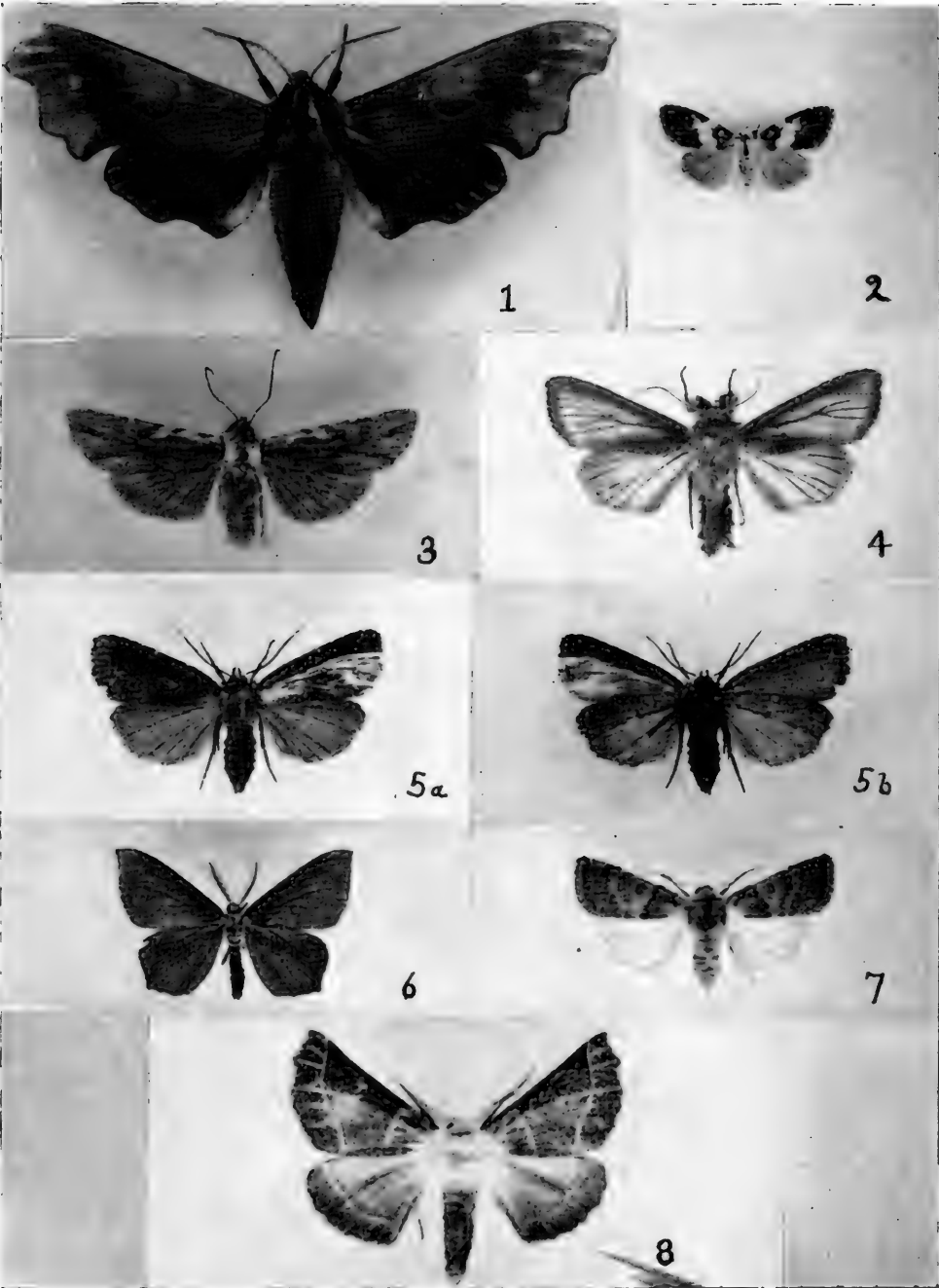
Mr. L. J. EVANS—Two cases containing 104 species of Heterocera obtained from Sutton Park, North Warwickshire, mainly during the years 1951, 52, 53, 54. As this park is scheduled as a "23 site" by the Nature Conservancy, work is continuing there. Not all the species recorded were shown. The list at present stands at 15 butterflies and 155 moths.

Mr. R. FAIRCLOUGH—The following Lepidoptera:—One *Heterographis oblitella* Zell. "This, taken 18.ix.1953, in Surrey, and Mr. H. C. Huggins' specimen of 29.ix.53 seem to be the only records of this insect since 1876 (see *Ent. Rec.*, 66: 2 and 84)". 5 *Ptilophora plumigera* Schiff., Kent, 1953. The following species taken or bred in 1954:—Short series of *Actebia praecox* L., *Eustroma reticulata* Schiff., *Venusia cambrica* Curt., one *Euxoa cursoria* Hufn., one *Semiothisa liturata* Cl. ab. *nigrofulvata* Coll. from Lancashire; a series of *Perizoma minorata* Treit. s.sp. *ericitata* Curt. from Yorkshire W.R. including one ab. *monticola* Strand; a series of *Oidaematophorus osteodactylus* Zell., 3 *Eupithecia expallidata* Dbl. and one *Plusia bractea* Schiff. from Westmorland; 2 *Coenoteaphria berberata* Schiff. (bred), a series of *Lithostege griseata* Schiff., 4 *Anepia irregularis* Hufn., 3 *Scopula rubiginata* Hufn., 2 *Evergestis extimalis* Scop., and some *Loxostege sticticalis* L. from Suffolk; 4 *Aegeria flaviventris* Staud., bred Surrey, 4 *Hadena albimacula* Borkh. bred Kent, some *Cucullia lychnitis* Ramb. bred Berkshire; one *Heterogenea asella* Schiff., Bucks., a series of *Eucosma pygmaeana* Hb. (from Silver Fir) and 6 *Cirrhia ocellaris* Borkh., Surrey.

Mr. IAN G. FARWELL—The following Lepidoptera:—*Maniola tithonus* L. ab. *antitransformis* Leeds, ♂, taken at Swanage, 1.viii.1954. *Aphantopus hyperantus* L. ab. *caeca* Fuchs, ♂, taken in the New Forest, 14.vii.1954. *Aricia agestis* Schiff., a slight ab. forewings only showing slightly elongated spots and streaks of white running through the usual ground colour, ♀, taken in Southern England, 5.ix.1954. *Lysandra bellargus* Rott., (1) ab. "anti-mellaina-suffusa" B. & L., ♂, taken in Southern England by Bertram J. Ham, 30.vi.1954; (2) ab. "caeca + sagittata + post alba" B & L., ♂, taken in Southern England, 30.vi.

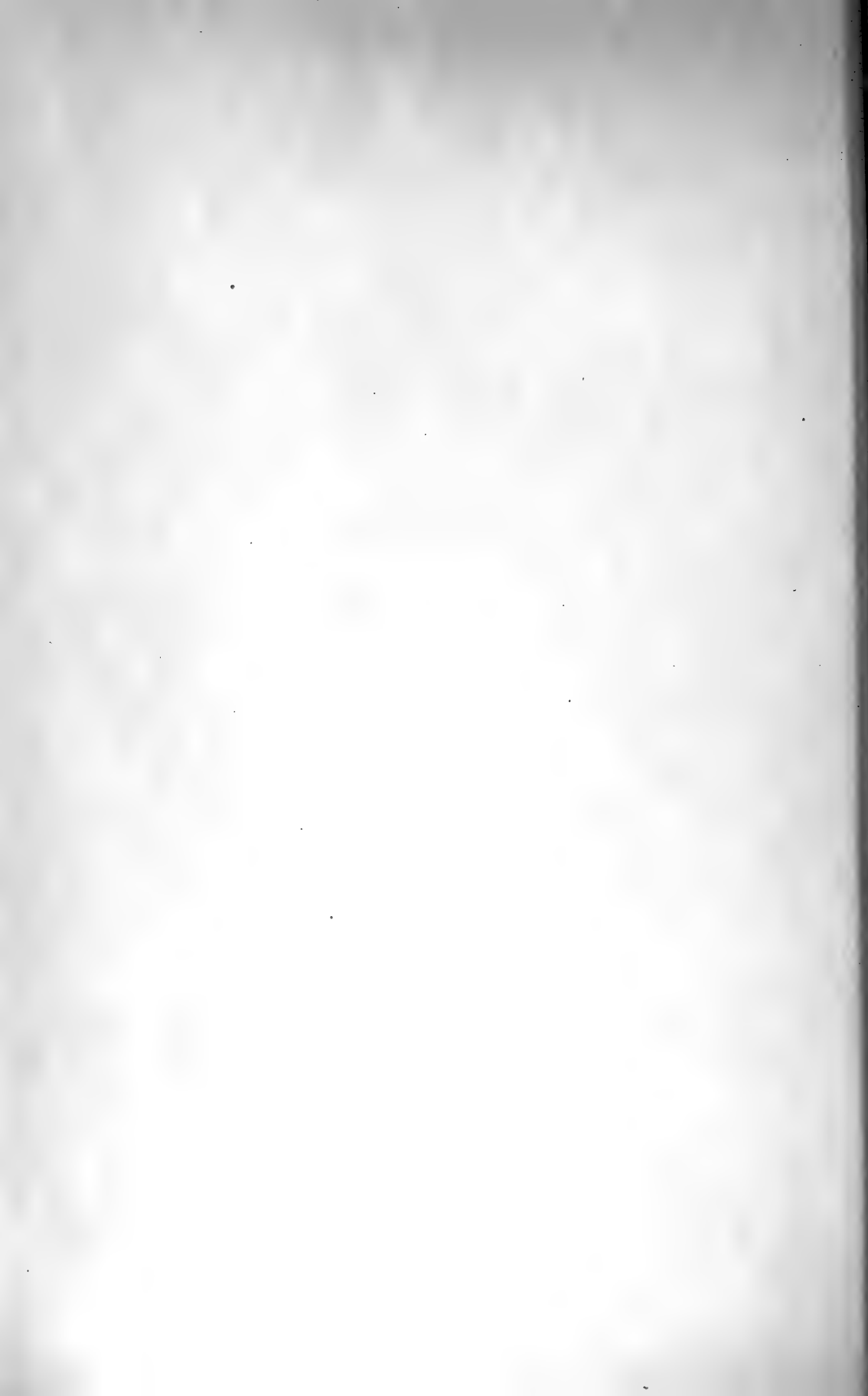
#### EXPLANATION OF PLATE II.

- Fig. 1. *Mimas tiliae* L. melanic ab. Mr. H. D. Swain.  
 Fig. 2. *Nola strigula* Schiff. ab. Mr. P. J. Burton.  
 Fig. 3. *Lithophane (Graptolitha) lapidea* Hb. Mr. R. Eldon Ellison.  
 Fig. 4. *Diataraxia oleracea* L. ab. Cmdr. G. W. Harper.  
 Fig. 5a and 5b. *Rusina umbratica* Goeze ab. upper and under-sides. Mr. T. G. Howarth.  
 Fig. 6. *Calothysanis amata* L. ab. *niger* Rbl. Mr. T. G. Howarth.  
 Fig. 7. *Caradrina ambigua* Schiff. ab. Mr. E. W. Classey.  
 Fig. 8. *Crocallis elingvaria* L. Very heavily speckled ab. Mr. A. M. Morley.



Annual Exhibition : 30th October 1954.

*Photos. W. H. T. Tams.*



1954 (Plate I, fig. 1). *Zygaena trifolii* Esp. (1) ab. *minoides*, Selys., ♀, taken in the New Forest, 21.vi.1947; (2) ab. with very broad border (underwing), ♂, taken in the New Forest, 30.vi.1954; (3) A "black" ab., ♂, taken by the late Mr. T. H. L. Grosvenor, in Sussex, 7.vii.1923. *Zygaena filipendulae* L. (1) ab. *flava* Robson, ♀, taken near Winchester, 3.viii.1953; (2) ab. showing right hindwing almost yellow, ♀, taken at Swanage, 10.viii.1953.

Mr. J. FIRMIN—(1) A series of *Hadena compta* Schiff. from Colchester. "The specimens of *Hadena compta* exhibited were captured at Colchester during the last week of June and the first week of July 1954. The first insect, a male, was taken on June 24th. Several female insects were subsequently obtained from the same locality, as they flew at dusk over Sweet William flowers. These were placed in muslin cages on growing plants of Sweet William and laid a number of creamy white eggs on the outside of the pistils or adjacent stamens. The long ovipositor, which could be seen in the female specimens exhibited, was used to place the ova almost at the base of the pistil. The larvae fed inside the seed capsules and later on flower petals and foliage. The larvae tunnelled into earth and some of the resulting pupae were shown separately". (2) *Scopula emutaria* Hb. and *Leucania favicolor* Barr., taken on North Essex Salt Marshes in July 1954.

Mr. L. T. FORD—*Salebria obductella* Zell. and *Depressaria pimpinellae* Zell.

Dr. J. F. D. FRAZER—*Erebia epiphron* Knoch, male with wide and bright orange band (Langdale Pikes, July 1954). *Maniola jurtina iernes* Graves, 4 males with white pupil entirely missing from spot on upper surface of forewing, and greatly obscured on lower surface (various Irish localities, July 1954). *Pieris napi* L., one buff-coloured female and two albinistic ones, bred from captured females (Kent, May 1954).

Mr. A. E. GARDNER—(1) Trichoptera:—*Phryganea varia* Fab., *Glyptotaelius pellucidus* (Retz.), *Limnephilus marmoratus* Curt., *L. lunatus* Curt., *L. centralis* Curt., *L. sparsus* Curt., *L. luridus* Curt., *Stenophylax vibex* (Curt.), *S. stellatus* (Curt.), *Silo pallipes* (Fab.), *Odontocerum albicorne* (Scop.), *Plectrocnemia geniculata* McLach., *Rhyacophila dorsalis* (Curt.), *Hydropsyche instabilis* (Curt.), *Lepidostoma hirtum* (Fab.), *Holocentropus picicornis* (Steph.) and *Agapetus fuscipes* Curt. All taken at mercury vapour light at Keswick, Cumberland, and Lake Windermere, Westmorland, 12-15.vii.54, by Mr. F. T. Vallins. (2) Orthoptera:—*Tettigonia viridissima* L., *T. cantans* (Fuessly), *Platycleis occidentalis* Zeun., *Podisma alpina* (Koll), *Calliptamus italicus* (L.), *Oedipoda coerulescens* (L.), *O. miniata* (Pall.), *Sphingonotus coeruleans* (L.), *Stauroderus scalaris* (F.W.), *Chorthippus biguttulus* (L.), *Acropus sibiricus* (L.) and *Arcyptera fusca* (Pall.). All taken by Mr F. T. Vallins, 22.vii-2.viii.54, Hautes Alpes, France. (3) Hymenoptera:—*Trichiosoma tibiale* Steph., Epsom, Surrey, 1947; *Cimbex femorata* (L.), Esher, Surrey, 1939; *Urocera (Sirex) gigas* (L.), females from Norfolk, 1952-53; and *Sirex noctilio* (Fabr.), a female



from Oxshott, Surrey, 1930, and a male from a Feltham, Middx., timber yard, E. W. Classey), 18.x.54. (4) Odonata:—*Oxygastra curtisii* (Dale), a male taken in S. Hampshire, 18.vii.54, and a mature living larva bred from eggs deposited on the 13.vii.52 which hatched 4.viii.52. Adult female living larvae and exuviae of the African species *Orthetrum stemmale capense* (Calvert) bred from eggs deposited 4.vi.54 which hatched 24.vi. Parent female from River Namugongo, Mengo Prov., Uganda, Dr. P. S. Corbet. The 12th and final larval instar was reached 14.viii., and one perfect female emerged 17.ix.54. The water temperature was controlled at 85° F. with a variation of  $\pm 2^\circ$  F. *Ischnura pumilio* (Charp.) live 8th instar larvae bred from eggs deposited 20.vii.54 which hatched 12.viii.54. The female was taken 19.vii.54, by Mr. J. Cowley in the New Forest, Hants. Life histories:—*Agrion virgo* (L.) (Odonata) and *Dytiscus marginalis* L. (Coleoptera), mounted by W. H. Janson and Son.

Mr. P. J. GENT—Lepidoptera:—(1) From Northamptonshire, *Apatele rumicis* L., a melanic example; *Ochropleura plecta* L., with orbicular mark extended in a streak almost to the base; *Agrotis exclamationis* L., with orbicular, reniform and claviform fused together; *Orthosia gothica* L., with discal cell and submedian dash brownish in colour; and *Ematurga atomaria* L., a suffused specimen with a few subterminal spots. (2) From Dorset, *Chiasmia clathrata* L., a dark fuscous variety with but three subterminal spots on fore- and hindwings.

Mr. P. J. GENT for Mr. J. H. PAYNE—Two halved gynandromorph *Polygonia c-album* L. set upper and underside, bred, Northamptonshire, 1954, and one *Aglais urticae* L. female, upperside, with right forewing showing traces of homocosis, bred, Northamptonshire, 1953.

Mr. B. GOATER—(1) *Lysandra coridon* Poda, an aberration of the male, in which both forewings are nearly obsolete, the right hindwing is obsolete, and the left hindwing striate, Winchester, Hants., 18.viii.1941. (2) *Philudoria potatoaria* L., a short series showing variation in the female, bred from larvae taken in Hants. in June 1953.

Mr. B. S. GOODBAN—See Mr. W. E. MINNION.

Mr. A. L. GOODSON—See Dr. H. B. D. KETTLEWELL.

Mr A. W. GOULD—Coleoptera taken at High Halstow, Kent, 1954. Mr. Gould supplied the following notes:—"During the past season a limited area of the North Kent Thames marshes was worked for Coleoptera, and the exhibit comprised a selection from the 350 species which have so far been taken. The area may conveniently be divided into four zones—(A) salt marsh, (B) grazing marsh, (C) arable land and farmyard, (D) dense woodland. A brief description of each zone and a list of the beetles exhibited is given below.

(A) SALT MARSH—Permanent salt marsh extending from the sea-wall to the river at Egypt Bay and St. Mary's Bay. Several acres with a dense covering of sea-purslane (*Halimione portulacoides* (L.) Aell.), sea-lavender (*Limonium vulgare* Mill.), sea-aster (*Aster tripolium* L.) and sea-wormwood (*Artemisia maritima* L.), with isolated patches of

*Spartina Townsendii* H. & J. Groves. Beetles taken included *Ophonus ardosiacus* Luts. (*rotundicollis* Fr.), *O. melleti* Heer, *Agonum thoreyi* Dej., *Risophilus imperialis* Germ., *Polydrusus chrysomela* Ol., *Baris scolopacea* Germ.

(B) GRAZING MARSH—An extensive level area of grass, intersected by brackish ditches and large "fleets" bearing a dense growth of *Phragmites communis* Brit. Flor. A few old willows and some stunted sloes give the only cover for a large population of cattle and sheep. Thousands of rabbits have recently been wiped out by myxomatosis. Beetles taken included *Anisodactylus binotatus* F. ab. *spurcaticornis* Dej., *Feronia macra* Marsh., *Dromius notatus* Steph., *Dytiscus circumflexus* Fab., *Gyrinus caspius* Mén., *Ocypus compressus* Marsh., *Rugilus (Stilicus) rufipes* Germ., *Coccidula scutellata* Hbst., *Aphodius fossor* L., *A. haemorrhoidalis* L., *A. fimetarius* L., *A. constans* Duft., *A. rufescens* Fab. (*rufus* Moll nec Deg.), *A. zenkeri* Germ., *A. rufipes* L., *Silis ruficollis* Fab., *Malachius bipustulatus* L., *M. viridis* Fab., *M. marginellus* Ol., *M. vulneratus* Ab., *Anthocomus rufus* Hbst., *Sitona lepidus* Gyll. (*flavescens* Marsh. nec Fab.), *S. sulcifrons* Thnbg., *Phytonomus rumicis* L., *P. posticus* Gyll. (*variabilis* Hbst. nec Fab.), *Bagous tempestivus* Hbst., *B. subcarinatus* Gyll.

(C) ARABLE LAND AND FARMYARD—Decoy Farm and meadows, standing on alluvium and London Clay, above flood level. Tree-lined ditches and fields, and a few freshwater ponds. Beetles taken included *Feronia longicollis* Duft., *Hygrobia hermanni* Fab., *Berosus affinis* Brullé, *Mycetophagus 4-guttatus* Müll., *Dermestes lardarius* L., *Aphodius granarius* L., *Necrobia violacea* L., *Sitophilus (Calandra) granarius* L.

(D) DENSE WOODLAND—Northward Hill Wood clothing a steep ridge of London Clay, but with a narrow strip of Thanet sand at the western end. Elm is the dominant tree; oak, ash, hawthorn and willow are common. Beetles taken included *Odontonyx rotundatus* Payk., *Biphylus lunatus* Fab., *Ischnomera caerulea* L., *Dasytes aerosus* Kies., *Opilo mollis* L., *Hedobia imperialis* L., *Pogonochaerus hispidus* L., *P. hispidulus* Pill & Mitt., *Mordellistena variegata* Fab., *Barypithes araneiformis* Schrank., *Liophloeus tessulatus* Müll. and v. *maurus* Marsh., *Rhynchaenus (Orchestes) quercus* L., *Magdalis armigera* Geoff. in Fourc., *Scolytus multistriatus* Marsh.

Mr. G. C. D. GRIFFITHS—Three additions to the British List of *Agromyzidae* (Dipt.), one of them new to science, taken at field meetings of the Society. (1) *Agromyza distorta* Griffiths. Type male bred from *Glyceria maxima* (Hartm.) Holmb., in which it made a mine similar to that of *Agromyza nigripes* Meigen. At the time of capture it was in the pupal stage affixed to the leaf. The fly emerged on 18/5/54, having been taken 5/9/53 at Ash Vale, Surrey. [A description of the new species appeared in the *Entomologist's Gazette*, 6: 10] (2) *Phytomyza virgaureae* Hering. Bred from *Solidago virgaurea* L., taken at Chilworth, 31/7/54. Fly emerged 14/8/54. This is an extremely interesting locality as none of the 3 species (*Phytobia posticata* Meigen, *Ophiomyia maura* Meigen, *Phytomyza solidaginis* Hendel) normally

taken in Kent occurs. Only *P. virgaureae* was found, which has not been taken in Kent. (3) *Liriomyza pusio* Meigen. Bred from *Tragopogon pratense* L., taken at Eynsford, Kent, 14/8/54. Fly emerged 4/9/54. This species was incorrectly added to the British List, but has been deleted by Mr. Spencer in a paper now in the press. This is the first true British specimen!

Mr. G. M. HAGGETT—Lepidoptera as follows:—(1) *Actinotia polyodon* Clerck, a worn male taken in mid-Sussex on 5.vi.1954. (2) *Spilosoma lubricipeda* L., very lightly spotted and very heavily spotted varieties, Arundel, 1954. (3) *Calophasia lunula* Hufn., series from West Sussex, East Sussex and Dungeness. Bred, 1954. (4) *Phlyctaenia (Nascia) ciliaris* Hb., preserved larva, pupa, cocoon and moth from Wicken Fen, bred out 1954. (5) *Arctia caja* L., a variety with brown patches much reduced on the forewings, Arundel, 1954. (6) *Ennomos quercinaria* Hufn., very dark ab. *angularia* Hufn., Arundel, 1954. (7) *Amathes triangulum* Hufn., aberration with stigmata and associated markings greatly reduced, Arundel, 1954.

The Rev. A. H. H. HARBOTTLE—(1) Moths taken in Kent during 1953 and 1954, including a dwarf *Euproctis chrysorrhoea* L., 2 *Leucania albipuncta* F., a ♀ *Colobochoyla salicalis* Schiff. (Ham Street), 6 first brood *Euphyia luctuata* Schiff. (the first taken on 11th May 1954), and a fresh *Zygaena trifolii* Esp. ab. *lutescens* Cockerell (from Wye). (2) Moths taken elsewhere in 1954, including 4 *Heliothis maritima septentrionalis* Hoffmeyer from Fordingbridge, Hants., and a specimen of *E. luctuata* Schiff. from Sussex, whiter than the Kentish specimens. (3) Pupae and a preserved larva of *E. luctuata* Schiff., pupae of *Hyloicus pinastri* L. from Bournemouth, Hants., and pupae of *C. salicalis* Schiff. with a dozen cocoons on dead twigs of *Populus tremula* L., showing stripped bark chewed up and mixed with the silk.

Mr. E. J. HARE—Lepidoptera:—(1) *Calophasia lunula* Hufn., male and female, Dungeness, Kent, bred 30.vi and 3.vii.1953, from the first larvae found in Britain (25.viii.1952), also a female (same locality) with unicolorous hindwings, bred 21.vi.54. (2) Short series of *Anarta melanopa* Thnbg., Inverness-shire, May 1954, showing variations. (3) *Jaspidia (Lithacodia) deceptor* Scop., male, Orlestone, Kent, May 1954 (Plate I, fig. 2). (4) From Co. Clare, Eire, 20th-26th July 1954:—*Argynnis aglaia* L., a dark female; three *Phothedes captiuncula* Treits. of different forms; two *Alucita icterodactyla* Mann. (5) Aberrations, taken in the exhibitor's garden at Pinden, Dartford, Kent, in 1954, of *Agrotis puta* Hb., *Euxoa nigricans* L., *Cosmia affinis* L., *Hadena lepida* Esp. and *Orthosia gothica* L.

Commander G. W. HARPER, R.N.—(1) Some interesting species of Lepidoptera taken in the Norfolk Broads and the Breck during a short holiday, 1954, including *Drymonia dodonaea* Schiff., *Pterostoma palpina* Cl., *Spilosoma urticae* Esp., *Eustrotia uncula* Cl., *Earias clorana* L., *Zanclognatha cribrumalis* Hb., *Phragmataecia castaneae* Hb., *Simyra albovenosa* Goeze, *Chilodes maritima* Tausch., *Anepia irregularis* Hufn., *Scopula rubiginata* Hufn., *Polia nitens* Haw., *Heliophobus anceps*

Schiff. (2) Lepidoptera from the Inverness-shire Highlands, Badenoch district, taken and bred in 1954, to show normal variation. Species including *Ortholitha mucronata* Scop. s.sp. *scotica* Cockayne and *O. plumbaria* Fab., *Dyscia fagaria* Thunb., *Euphyia rubidata* Schiff., and *Gnophos myrtillata* Thunb. were shown. Also a fresh ♂ *Amathes alpicola* Zett. taken on a rock in the Cairngorm Mountains at 2700 feet, on 12.viii.54, a late date; *Cucullia chamomillae* Schiff., taken at m.v. light on 21.iv.1954, believed to be a most Northern record for this species; an unusual aberration of *Apamea secalis* L.; a very remarkable and rare aberration of *Diataraxia oleracea* L., in which all usual markings are obliterated by an ochreous suffusion on all wings (Plate II, fig. 4), and an uncommon pink form of *Laotboë populi* L.

Mrs. E. A. HESLOP—(A) The following butterflies all taken by the Exhibitor:—(i) An extreme example of *Limenitis camilla* L. ab. *nigrina* Weym., taken in Somerset in 1952. (ii) Three male specimens of *Apatura iris* L., taken in Wiltshire in 1952, 1953, and 1954 (27th July). (B) A collection of 21 specimens of Lepidoptera (comprising 13 species) taken by Miss Jane Heslop, aged 2 years 4 months to 4 years 6 months, in her first three seasons (1952, 1953, and 1954). The collection included *Euphydryas aurinia* Rott., *Thecla betulae* L., and *Eumichtis lichenea* Hb. Nineteen of the specimens were taken in Somerset, and two in Dorset.

Mr. I. R. P. HESLOP—The following butterflies all taken by the exhibitor:—(i) *Apatura iris* L. Three male specimens taken in 1954, comprising a specimen bred on 10th July from a larva collected in Sussex on 17th May, and two specimens caught in Wiltshire on 22nd and 27th July respectively. Also shown were four cards illustrating the life history of the bred specimen. The horns of the larva of this were remarkably asymmetrical, as could be seen from the preserved cast larva skin mounted on one of the cards. The specimen of 22nd July came in at the window of the exhibitor's car, and was secured with a killing bottle. (ii) *Aphantopus hyperantus* L. An ab. *lanceolata* Shipp caught in Wiltshire on 16th August 1954. (iii) *Thecla betulae* L. Six specimens (three males and three females) from Somerset (bred in 1954); and ditto from Huntingdonshire (bred in 1927). "This representative selection from long series from both counties showed the difference in size and coloration between typical specimens and the very large and rich Somerset race. The size of the Somerset specimens ranged from three to four millimetres more than that of the Huntingdonshire ones in the male; and from five to six millimetres more in the female. Care had been taken to make the comparison as fair as possible: actually some larger specimens of the Somerset race have been bred by the exhibitor in previous years. Both series here represented were reared on Plum."

Mr. T. J. HONEYBOURNE—Imagines of *Eacles magnifica* Walker, *Citheronia brissotii* Boisd., *Rothschildia jacobaeae* Walker, *Automeris viridescens* Walker and *A. coresus* Boisd. from South America and *Epiphora atbarina* Butler s.sp. *sudanica* Le Cerf from Sudan.

Mr. and Mrs. T. G. HOWARTH—A specimen of *Hydraecia hucheradi* Mab. one of five taken in one night in October 1953 in S. Kent. Also specimens from a mercury vapour light trap in their garden in South Hertfordshire including *Nola albula* Schiff. (the first Hertfordshire record), *Cucullia absinthii* L., a female of *Rusina umbratica* Göze (*tenebrosa* Hb.) of an unexplained abnormality showing pale scales on right foreleg, patagium and forewing (Plate II, figs. 5a, 5b), *Parascotia fuliginaria* L. (the first Hertfordshire record), the exceedingly rare ab. *niger* Rebel of *Calothyranis amata* L. (Plate II, fig. 6), and a specimen of *Pyrausta nubilalis* Hb., the migrant European Corn Borer, taken on 17.x.1954, also a photo of the latter taken by Mr. E. L. Martin.

Captain R. A. JACKSON, R.N.—(1) A series of *Lysandra coridon* Poda aberrations from Wiltshire, including (a) ♂ uppersides, *fowleri* South, and a dark form (? ab. *metallica* B. & L.); (b) ♂ undersides, *arcuata* Courv., *costajuncta* Tutt, *bi-I-nigrum* B. & L., *radiata* Courv. on all four wings on a whitish ground, *parvipuncta* Rebel, 4 *caeca* Courv., 2 very near *lucretia* South and a dark grey form; (c) ♀ uppersides, *syngrapha* Kef., *semisyngrapha* Tutt, 2 other bluish forms, one with orange lunules on all four wings, and 2 *transformis* B. & L.; (d) ♀ undersides, *arcuata* Courv., *costajuncta* Tutt, *basijuncta* Tutt, *bi-I-nigrum* B. & L., *lucretia* South, and one specimen *transversa* B. & L. on left hindwing. (2) A ♀ underside of *Lysandra bellargus* Rott., mainly ab. *caeca* B. & L., but with the black marginal spots tending towards ab. *radiata* Gaschet; a very pale ♂ of *Drymonia dodonaea* Schiff. (*trimacula* Esp.) with the marginal band almost white; a ♂ *Craniophora ligustri* Schiff. ab. *nigra* Tutt; *Apocheima hispidaria* Schiff. with a broad white marginal band on the forewings and almost white hindwings; a ♂ *Crocallis elinguaris* L. with all wings heavily speckled with blackish brown.

Mr. F. V. L. JARVIS—Lepidoptera:—(1) Two short series of *Colias australis* Verity and a series of *C. hyale* L. raised in Sussex in the summer of 1954 were exhibited. These series were both from Swiss ova and were raised together in the same room at a steady temperature near to 65° F.; the object being to eliminate environmental variables and so give a sounder basis for specific comparison. Coloured drawings of all stages of both species, made in the course of the experiment, were also exhibited. (2) A series of coloured drawings was shown illustrating the various phases of diapause in the larva of *Apatura iris* L. (3) An extreme and symmetrical *Argynnis aglaia* L. ♂ showing completely defective scaling over both surfaces of the hindwings; forewings normal. Taken by V. Jarvis at Villars-Chesières, Switzerland, 1st August 1954.

Colonel S. H. KERSHAW and Major R. M. KERSHAW—Lepidoptera:—(A) Selected Gynandromorphs taken by G. B. Kershaw, Colonel S. H. Kershaw and Major R. M. Kershaw. (1) Two *Polyommatus icarus* Rott., right side ♀, left side ♂, one taken by G. B. Kershaw at Llanbedrog, N. Wales, August 1905, and the other by Colonel Kershaw in the Isle of Man, August 1942. (2) *Vanessa atalanta* L. (S.H.K), Isle

of Man, October 1947. A possible Gynandromorph, as right side wings are male, left female in shape. (3) *Gonepteryx rhamni* L., Major Kershaw, Beds., August 1935. (4) *Euchloë cardamines* L., showing male orange streaks, bred (S.H.K.) from Kent (Plaxtol) ova. Emerged 24th April 1938. (5) *Pieris rapae* L., left side female, right side male; taken by S.H.K. at Aspley Heath, Beds., 17th July 1938. (6) *Pieris napi* L., Col. Kershaw added the following note: "At Royston in late August 1954 I saw a pair of *napi* 'in cop.', and boxed both as I wanted one of them for underside. They remained in cop. until I reached home 1½ hours later. When they separated, I put the underside, which I wanted, in the killing bottle, and put the other (also exhibited alongside) in a separate box, after examining it and seeing that it was a definite female. As the insect in the killing bottle died, its wings opened, and to my amazement I saw that it was apparently also a female! On closer examination, I am inclined to think that it has a male body, but leave that to the experts to decide." (7) *Pieris napi* L., male with female spots. Origin—Donegal: bred W. H. Head, July 1931. (B) Minor 'vars.' taken by J.I.K., R.M.K. and S.H.K. in 1954; (a) *Lysandra coridon* Poda, male ab. *caeca* Courv. underside, J.I.K., Gloucs., August. (b) *Pararge aegeria* L., a few spots of pearly-white on F.W.'s; those on rest of F.W.'s hidden by brown-black scales; taken by S.H.K., Aspley Heath, August 1954. (c) *Vanessa atalanta* L., lowest spot on apex of F.W.'s missing; S.H.K., Aspley Heath, August 1954. (d) *Aricia agestis* Schiff., two ♀♀ with obsolescent H.W.'s, R.M.K., Totternhoe, Beds., August 1954. (e) *Cupido minimus* Fuessl., S.H.K., Totternhoe, September 1944—ab. *minutissimus* B. & L. (second brood).

Dr. H. B. D. KETTLEWELL, University Museum, Oxford, and Mr. A. L. GOODSON, Zoological Museum, Tring, for the Rothschild-Cockayne-Kettlewell Collection—(1) A series of 38 *Hydraecia hucherardi* Mab. collected from September 28th to October 6th, 1954, at mercury vapour light by Kettlewell and Goodson, after discovering the foodplant of the larva, hitherto unknown, and working areas where the plant was most concentrated. (2) Series of *Calophasia lunula* Hufn. bred from wild larvae collected at Dungeness by A. L. Goodson. (3) Extremely red aberration of *Cosmia trapezina* L. (ab. *rufa* Tutt). (4) Well banded aberration of *Orthosia stabilis* Schiff. (5) Asymmetrical aberration of *Mamestra* (*Barathra*) *brassicae* L. (6) Typical form and three ab. *plumbea* Cockayne of *Eilema deplana* Esp. (*depressa* Esp.). (7) *Lithomoia solidaginis* Hb. ab. *cinerascens* Stgr. collected at Tring. A migrant, presumably from N. Germany. (8) *Plusia gamma* L. ab. *nigricans* Spuler collected in S. Sussex by A. L. Goodson. (9) *Arctia caja* L. aberration of spotting. (10) *Triphaena pronuba* L., two specimens showing extreme shades of light and dark yellow. (11) Extreme aberration of *Triphaena pronuba* L. with hindwings completely darkened and forewings brown black, ab. *postnigra* Turner (Plate I, fig. 7). (12) *Luperina dumerilii* Dup. taken at mercury vapour light in S. Sussex, September 1954, by A. L. Goodson. (13) *Notodonta ziczac* L. aberration with blackened forewing markings. All the above, except where otherwise



stated, were collected at Tring, Herts., by A. L. Goodson. (14) Separate drawer showing pressed specimen of leaves and flowers of the Marsh Mallow (*Althaea officinalis* L.), the root of which is the food of the larva of *Hydraecia hucherardi* Mab. Parts of affected roots in which frass was found. ♀ pupa preserved in spirit and pupa case with crippled ♀ which emerged from it. Photographs of root and plant complete and of a root showing borings. Photograph of the egg magnified ×60. (15) Separate drawer showing some exceptional Macrolepidoptera, mainly from Feltham, collected in 1954 by E. W. Classey and presented to the Rothschild-Cockayne-Kettlewell Collection, as follows:—(a) *Sphinx ligustri* L., dark aberration (nov.). (b) *Triphaena pronuba* L., with white apical marks. (c) *Agrotis exclamationis* L., halved gynandromorph. (d) *Lithomoia solidaginis* Hb. ab. *cinerascens* Stgr., taken at Feltham. Migrant, presumably from N. Germany. (e) *Melanchra persicariae* ab. *ochrorensis* Kard., with yellow stigmata. New form to Britain. (f) *Cryphia perla* Schiff., pale and dark forms. (g) *Procus literosa* Haw. ab. *aethalodes* Richardson and transitional form, the former being black. (h) *Caradrina (Athetis) ambigua* Schiff., with aberrant markings (Plate II, fig. 7). (i) *Spilosoma lutea* Hufn., with striated markings. (j) *Hydraecia hucherardi* Mab., taken in S. Kent, September 1954, by E. W. Classey. (k) *Zanclognatha tarsipennalis* Treits., light and dark forms. (l) *Discestra trifolii* Hufn., dark forms. (m) *Apatele aceris* L., extreme forms of ab. *candelisequa* Esp. (n) *Parascotia fuliginaria* L., from Feltham, Middlesex.

Dr. HAROLD KING—A series of moths bred or netted in 1954 or late 1953. (1) *Eupithecia centaureata* Schiff. (*oblongata* Thnbg.), Dorset, bred. (2) *E. goossensiata* Mab., New Forest, bred. (3) *E. assimilata* Dbld., Dorset, bred. (4) *E. jasioniata* Crewe, N. Wales, bred from pupae reared by Mr. B. B. Snell. (5) *E. subumbrata* Schiff., Dorset, bred. (6) *E. millefoliata* Roessler, Hants, bred. (7) *Chloroclystis coronata* Hb., Dorset, bred. (8) *Eupithecia icterata* Vill. s.sp. *subfulvata* Haw., Dorset, netted. (9) *E. pimpinellata* Hb., Dorset, 3 specimens bred, 3 netted. (10) *E. linariata* Schiff., Dorset, bred. (11) *E. tripunctaria* H.-S., Dorset, bred from larvae on *Angelica*. (12) *Euphyia cuculata* Hufn., Dorset, bred. (13) *Sterrrha degeneraria* Hb., Dorset, netted. (14) *Gypsites leucographa* Schiff., Surrey, bred from ova from a female taken by Dr. Charles de Worms. (15) *Jodia croceago* Schiff., Kent, bred from ova from a female taken by Dr. Charles de Worms. (16) *Aegeria sphecoformis* Schiff., Hants, assembled by a virgin female.

Mr. M. J. LEECH—Lepidoptera from the following localities:—(1) BATTLE, SUSSEX—A series of *Tethea fluctuosa* Hb.; typical specimens and aberrations of *Meristis trigrammica* Hufn., *Leucania pallens* L., one with unusual scale formation on hindwings; *Ectropis consonaria* Hb.; series of *Ectropis extersaria* Hb. (*luridata* Borkh.). (2) HAILSHAM, SUSSEX—Bred series of *Cosymbia punctaria* L. with blush mark very pronounced. (3) VERT WOOD, SUSSEX—A series of *Euphyia luctuata* Schiff. (4) SUSSEX—Bred series of *Cosymbia pendularia* Clerck (*orbicularia* Hb.). (5) TILGATE FOREST, SUSSEX—Short series of

*Xanthorhoë designata* Hufn. (6) BOLTON, LANCS.—Dark form of *Lophopteryx capucina* L. (7) FORMBY, LANCS.—Series of twelve *Polyommatus icarus* Rott., most of which were referable to ab. *arcua* Wheeler; specimen of *Agrotis ripae* Hb., a species scarce in the district. Bred examples of *Lygris pruinata* L. Also a specimen of *Smerinthus ocellatus* L. with its associated Hymenopterous parasite *Callajoppa exaltatoria* Panz. (8) CLITHEROE AREA, LANCS.—Series of *Amathes castanea* Esp.; a dark specimen of *A. glareosa* Esp. with typical example and ab. *rosea* Tutt from Formby for comparison; single specimen of *Celaena haworthii* Curt. (9) SURREY—Bred series of *Apatele alni* L. and a bred series of *Dasycampa rubiginea* Schiff. (10) BIRMINGHAM, WARWICKSHIRE—Bred examples of *Cucullia absinthii* L. (11) GRASSINGTON, YORKS.—Specimen of *Anaplectoides prasina* Schiff.; series of *Perizoma minorata* Treits.; single specimens of *Entephria flavicinctata* Hb. and *Petilampa minima* Haw. (12) DUNGENESS, KENT—Series of *Eupithecia pulchellata* Steph. (13) HAM STREET, KENT—Specimen of *Aegeria sphecoformis* Schiff. (14) SILVERDALE DISTRICT, LANCS.—Specimens of *Perizoma bifaciata* Haw. (15) CONWAY, N. WALES—Bred specimens of *Amathes ashworthii* Dbld.

MR. DENNIS LESTON—(1) A collection of shieldbugs (Hem., Pentatomidae) made by Mr. F. T. Vallins in Hte. Alpes, France, l'Argentière, vii.1954, 1,000 m.: *Carpocoris pudicus* (Poda); *Rubiconia intermedia* (Wolff); *Eurydema herbacea* (H.-S.); *E. ornata* (L.); *E. ventralis* Kolen.; *E. oleracea* (L.), Roche de Rame, vii.1954, 1,000 m.: *Staria lunata* (Hahn); *Graphosoma italicum* (L.). (2) A collection of shieldbugs (Hem., Pentatomoidea) made by Dr. Wallace Peters in Liberia, Beila, viii.1953: *Caura pugillator* (F.); *Aspavia armigera* (F.); *Brachyplatys testudonigra* (Degeer), Dinjamo, viii.1953, and Kpaine, various dates: *Acrosternum horvathi* (Bergr.), known previously only from Gabon—the specimen, a female 19.0 mm. long, has been compared with the type; *Macrina juvenis* (Burm.); *Aspavia hastator* (F.); *Carbula cuneata* Dist.; *Halyomorpha* sp.; *Aethemenes nigropunctatus* (Sign.); *Platynopus rostratus* (Drury); *Hotea subfasciata* (Westw.); *Coridius* (= *Aspongopus*) *cuprifer* (Westw.); *Coridius* sp. "This note is apparently the first list of Liberian shieldbugs and is No. XXI of my 'Notes on the Ethiopian Pentatomoidea'." (3) *Nezara viridula* (L.) (Hem., Pentatomidae). "This bug is being brought into Britain during recent years with fruit or vegetables flown in from southern Europe; it cannot become established here." The exhibit showed its three genetic forms and the overlying physiological colour varieties. (4) *Aëpophilus bonnairei* Sign. (Hem., Aëpophilidae) and *Aëpopsis robinii* (Laboulb.) (Col., Carabidae) from the lowest *Fucus* zone, Wembury, S. Devon. Collected in numbers at low spring tide, 16.vii.1954. (5) A collection of classic works on the Heteroptera. Included were works by Caspar Stoll, Fabricius, Schilling, Spinola, Dufour, Amyot and Serville, Fieber, van Vollenhoven, Douglas and Scott, Dohrn and Stål. The works traced the outlines of Heteroptera taxonomy from the post-Linnaean school (Fabricius) up to Stål, the first modern author.



Brigadier C. G. LIPSCOMB—(a) *Argynnis selene* Schiff., ♂, ab. *morphosa* Spangberg, taken Wiltshire, 30.v.1954. (b) *Coenonympha pamphilus* L., a ♂ ab. having usual brown colour replaced with white, taken Somerset, June 1954. (c) *Aglais urticae* L., two abs.:—(1) Forewings with blue lunules represented by blue streaks, hindwings with blue lunules absent, red bar very reduced and clouded with black. Bred, Wilts., October 1954. (2) Forewings, normal reddish replaced by smoky pink; hindwings, normal reddish bar replaced by pink very heavily clouded with black. Bred, Wilts., June 1954. (d) *Lysandra coridon* Poda, two ♂ abs.:—(1) *olivacea* B. & L., Wilts., August 1954. (2) *ultrafowleri* B. & L., Wilts., September 1954.

Miss C. A. McDERMOTT—(1) Three generations of *Lycaena phlaeas* L., bred from a typical female caught in August 1953, at Borough Green, Kent. "1st gen. had a large proportion with blue spots. 2nd gen. was bred from 20-30 mixed blue-spotted specimens and about half of the 337 which hatched had blue spots. A large proportion had black veining on the forewings. 3rd gen. was bred from 40-50 black veined and blue spotted specimens. Only six have hatched; the rest are wintering as larvae." (2) Some Scottish butterflies:—*Coenonympha tullia* Müll. ab. *scotica* Stdgr. caught on Rannoch Moor, 2.viii.1954. *Erebia aethiops* Esp. caught at Strath Appin, 7.viii.1954. *Aricia agestis* Schiff. ab. *artaxerxes* Fab. caught at Strath Appin, 7.viii.1954. *Polyommatus icarus* Rott. ab. "*impuncta-postobsolata*" B. & L. (?) caught at Strath Appin, 7.viii.1954.

Dr. D. A. B. MACNICOL—*Amathes depuncta* L. (Kincraig, bred from ova, vii.1953); *Hapalotis venustula* Hb. (Fetcham, Surrey, 25.vi.1954); *Acleris hastiana* L. (bred from larvae, Glen Shee, ix.1952, and Pitlochry, ix.1949); *A. cristana* Schiff. (Bookham, Surrey, netted, viii and ix.1954); *Eretia logaea* Durr. (Aviemore, 22.iv.1950, common; Meyrick gives "Elgin, local" only for its distribution); *E. posticana* Zett. (Aviemore, 9.v.1948—occurs in the same places as the last species, but is out a month later); *Eucosma turbidana* Treits. (Edinburgh, 9.vi.1954); *Argyroproce grevillana* Curt. (Rannoch, 24.vi.1951); *Telphusa alburnella* Dup. (Aviemore, 12.vii.1949, recorded in Britain before in Yorkshire and the North of England only); *T. scalella* Scop. (Welwyn, Herts., 29.v.1953); *Oegoconia quadripuncta* Haw. (Fetcham, 17.vii.1954); *Myrmecozela ochraceella* Tengst. (Rannoch, 24.vi.1951—from nests of *Formica rufa*, in which the larvae feed. "This seems to be the only place in Britain where the moth has been taken, though *Formica rufa* (the Wood Ant) is so widespread. It suggests that the Rannoch ants are a separate species or race from the Aviemore and West Coast ones)."

Lt.-Col. W. B. L. MANLEY—A series of all of the following seventeen species of *Lycaenidae* taken in Liguria and Piedmont by Signor L. Storace, Signorina Migliardi and himself, between 21st June and 11th July 1954, inclusive:—*Cupido minimus* Fuessl., *Celastrina argiolus* L., *Philotes baton* Bergstr., *Iolana iolas* Ochs., *Maculinea alcon turatiana* Vrtý., *M. arion punctifera* Grund., *Lycaeides idas* L., *L. argyrognomon*

*laria* Vrtý., *Plebejus argus* L., *Cyaniris semiargus cimon* Vrtý., 1 generation *antecimon* Vrtý., *Polyommatus icarus* Rott., *Lysandra thesites meridiana* Vrtý., *L. escheri antivolvans* Vrtý., *L. icarius splendida* R.-Z., *L. bellargus etrusca* Vrtý., *L. albicans* H.-S. (1st and 2nd gens.), and *Meleageria daphnis* Schiff.

Rev. J. N. MARCON—Specimens of *Maniola jurtina* L. caught in Sussex, 1954, including 4 albinos (1 male, 3 females) of varying colour, one being extreme, another intermediate between the white form and type; 1 female with partial albinism on left forewing; 2 ab. *cervinus* Fhk. (= *grisea-argentea* Oberth.); 1 female with eye-spots to ocelli missing, and 1 female with an extra large amount of fulvous on both fore and hindwings.

Mr. R. M. MERE—Lepidoptera as follows:—*Calophasia lunula* Hufn., four imagines bred July 1954, from September 1953 larvae and four imagines bred August 1954, from June 1954 larvae; all from Dungeness areas. *Hydraecia hucherardi* Mab., ♂ taken 3.x.1953, ♂ taken 4.ix.1954, 2 ♂♂, 1 ♀ taken 2.x.1954, all South Kent. *Xanthorhoë montanata* Schiff., variety taken 16.vii.1954 at Keswick. *Euphyia luctuata* Schiff., 5 specimens showing variation in the dark marginal bands and dark central cross line. From Ham Street, Kent.

Mr. H. N. MICHAELIS—Lepidoptera:—*Pheosia tremula* Cl. and *Drepana binaria* Hufn., Didsbury, Lancs., 1954. *Nola albula* Schiff., Dungeness, Kent, Aug. 1954. *Spilosoma lubricepeda* L., streaked and buff forms from Manchester, 1926-30-54. *Eilema pygmaeola* Doubl., Dungeness, Kent, Aug. 1954. *Apatele leporina* L., Didsbury, Lancs., July 1954, a dark form. *Polia nebulosa* Hufn., Delamere, Cheshire, bred 1936-52, dark forms. *Hadena conspersa* Schiff., Stalybridge, Cheshire, June 1954 per S. Charlson; not recorded so far inland for many years. *H. lepida* Esp., Dungeness, Kent, Aug. 1954. *Zenobia subitosa* Schiff. and *Parastichtis suspecta* Hb., Didsbury, Lancashire, Aug. 1954. *Catocala fraxini* L., Kent, Aug. 1954, bred. *Comibaena pustulata* Hufn., Didsbury, Lancashire, July 1954, not previously recorded for Lancashire. *Lygris testata* L., series showing dark forms from Cheshire moorlands, 1954. *L. populata* L., series from Cheshire moorlands showing dark forms, July-Aug. 1950-54. *L. pyraliata* Schiff., Crowden, Cheshire, Aug. 1954. *Hydriomena furcata* Thunb., series showing dark forms bred from *Vaccinium*, Cheshire moorlands, 1952-54. *Colostygia didymata* L., Light and Dark forms from Cheshire moorlands, Sept. 1954. Pyraloidea:—*Euzophera cinerosella* Zell., bred, Portland, June 1954. *Myelois neophanes* Durrant, bred, Oxshott, Surrey, 1954. *Nephopterix genistella* Dup., bred, Selsey, Sussex, 1954. *Stenia punctalis* Schiff., *Cynaeda dentalis* Schiff., and *Pyrausta verbascalis* Schiff., Dungeness, Kent, Aug. 1954. *Scoparia ambigualis* Treits., Moorland and moss forms from Cheshire, 1950-54. *Platyptilia acanthodactyla* Hb., Bettisfield, Flintshire, Oct. 1953. *P. gonodactyla* Schiff., Stalybridge, Cheshire, bred, 1954. *P. ochrodactyla* Schiff., Wirral, Cheshire, bred, 1954, not recorded for many years. *Stenoptilia bipunctidactyla* Scop., Millers Dale, Derbyshire. *Marasmarcha lunaedactyla* Haw., Folkestone, Kent, Aug. 1954.

*Adaina microdactyla* Hb., Oldham, Lancashire, bred, June 1954. Tortricoidea:—*Phalonia dipoltella* Hb., Pevensey, Sussex, bred, 1954. *Ancylis siculana* Hb., Wilmslow, Cheshire, June 1954. *Hemimene saturnana* Guen., Wirral, Cheshire, June 1954, not previously recorded for Cheshire. Tinaeoidea:—*Xenolechia alburnella* Dup., Hartford, Cheshire, July 1953, not previously recorded for Cheshire. *Aristotelia palustrella* Dougl., Dungeness, Kent, Aug. 1954. *Ethmia bipunctella* Fabr., Lydd, Kent, Aug. 1954. *E. decemguttella* Hb., Mickleham, Surrey, bred, June 1954. *Lithocolletis anderidae* Fletcher, Wilmslow, Cheshire, bred, April 1954, with mine. *L. cavella* Zell., Cheshire Mosses, bred 1950-54, with mine. *L. ulmifoliella* Hb., Cheshire Mosses, bred April 1954, with mine. *L. nicellii* Staint., Nether Alderley, Cheshire, bred April 1954. *Glyphipterix haworthana* Steph., Delamere, Cheshire, May 1951.

Mr. W. E. MINNION and Mr. B. S. GOODBAN. (1) Lepidoptera:—*Drepana binaria* Hufn., a very small male, Dunsfold, Aug. 1951. *Apatele aceris* L., a small dark male, Pinner, May 1954. *Catocala fraxini* L., a short series, Ham Street, bred in Sept. 1954. *Xanthorhoë designata* Hufn., a short series with narrow bands, Dunsfold, bred 1954. *X. fluctuata* L. ab. *costovata* Haw., Pinner, June 1954. *Euphyia luctuata* Schiff., a short series, Hailsham dist., bred Aug. 1954. *Ennomos autumnaria* Wernb., 4 heavily spotted from Kent and 4 typical and 8 ab. *brunneata* Cockayne from Sussex, all bred September 1954. *E. quercinaria* Hufn., 4 dusky examples, Brighton, bred August 1954. *Selenia bilunaria* Esp., a very pale specimen, ? albino, Ruislip, April 1954. *S. lunaria* Schiff., a short series showing considerable colour variation, Stanmore, bred May 1953-4. *Menophra abruptaria* Thunb., an asymmetrical specimen. Bucks., bred April 1954. *Aethalura punctulata* Schiff., a specimen with inner two cross lines merged, Ruislip, June 1954. *Bupalus piniaria* L., a specimen with left hindwing pigmentless, Surrey, bred June 1954. (2) Photographs of Heterocera—Imagines and Larvae.

Dr. B. P. MOORE—(1) Living larvae of the dragonfly *Sympetrum fonscolombii* Selys, bred *ab ovis* from French stock. (2) Two cases of Coleoptera forming part of a collection made in the Pyrenees region, May-June 1954. Of particular interest were specimens of the pale Atlantic form of the Carabid *Eurynebria complanata* L. Examples of the darker British form were included for comparison.

Mr. D. MORE—Lepidoptera:—Three *Calophasia lunula* Hufn. with blown larvae and cocoon. Dungeness, Kent, 1954. Four *Euphyia luctuata* Schiff., caught and bred, Bilsington, Kent, 1954. One *Hydraecia hucherardi* Mab., found sitting in porch of an Inn at 10.45 p.m. on 2.x.1954, S.E. Kent. One *Margaronia unionalis* Hb., taken in mercury vapour trap at Hockley, Essex, 3.ix.1954. Two *Lasiocampa trifolii* Schiff., taken in mercury vapour trap, Dungeness, July/September 1954.

Mr. A. M. MORLEY—(1) Lepidoptera taken (with one exception) at Folkestone: *Euproctis chrysorrhoea* L. (vii.1930—male, body and antennae orange); *Apatele aceris* L. (vii.1919—male, pale form, which is usual in Folkestone); *Agrotis exclamationis* L. (vi.1930 and vii.1953—

two female varieties); *Plusia gamma* L. (27.ix.1953—male, tail of "Y" missing); *Abrostola tripartita* Hufn. f. *urticae* Hb. (vi.1930—male); *Euphyia luctuata* Schiff. (bred v.1954—two females of differing forms); *Crocallis elingvaria* L. (viii.1953—male ab. with thorax yellow, wings and body brown) (Plate II, fig. 8); *Lycia hirtaria* Clerck (v.1911—wing of ab. *fasciata* Prout.); *Biston betularia* L. (3 males, one typical but rather heavily marked and two dark ab. *insularia* Th.-Mieg., vii.1919, vii.1921 and vi.1922). (2) Exhibited on behalf of Mr. R. W. Fawthrop: *Lithomoia solidaginis* Hb. (ix.1954—apparently of continental origin); *Ennomos autumnaria* Wernb. (ix.1954—female, speckled with purple instead of usual brown).

Mr. G. B. OLIVER—Female specimens of *Argynnis paphia* L. reared 1954 (from the inbred strain of a specimen of ab. *valesina* Esp. taken in 1951):—A typically shaded upperside with forewings heavily marked and doubly banded hindwings (Plate I, fig. 5): Undersides of ab. *valesina*—intermediate, and typical, showing shades of the hindwings from bronze-brown to purple-violet. All males of this brood were of strictly typical form and colour.

Mr. L. PARMENTER—Some British Tabanidae (Diptera):—*Tabanus sudeticus* Zell., *T. verralli* Old., *T. autumnalis* L., *T. bromius* L., *T. miki* Brauer, *T. cordiger* Mg., *T. glaucopis* Mg., *T. maculicornis* Zett., *T. micans* Mg., *T. luridus* Fall., *T. tropicus* L., *T. bisignatus* Jaen., *T. montanus* Mg., *T. distinguendus* Verr., *T. fulvus* Mg., *T. nigrifacies* Gob.

Mr R. E. PARSONS—A male ab. of *Pararge megera* L. captured at Redruth, Cornwall, on 2.v.1953 (Plate I, fig. 3).

Mr. J. H. PAYNE—See Mr P. J. GENT.

Mr NORMAN C. PILLEAU—*Aphantopus hyperantus* L., a female without spots on underside, and two specimens of ab. *cabeui* Pionn.

Major-General A. L. RANSOME—Rhopalocera taken in 1954:—(1) *Maniola tithonus* L. ab. *partimtransformis* Leeds, Aug. (2) *Aphantopus hyperantus* L., two examples of ab. *caeca* Fuchs, July. (3) *Argynnis euphrosyne* L. five various aberrations, May. (4) *Polyommatus icarus* Rott., ♂ underside similar to the ab. *impuncta* Courv. of *Lysandra coridon* Poda, August. (5) *Lysandra coridon* Poda, ♂ uppersides showing examples of colour variation, including abs. *caeruleo* Tutt and *pallidula* Tutt and three dark forms; also an example of ab. *marginata* Tutt. ♀ uppersides showing abs. *postradiosa* B. & L., *syngrapha* Kef., *brunnescens* Tutt, *albolunulata* Tutt and *major* Tutt. Undersides, both sexes, abs. *impuncta* Courv. and *obsoleta* Tutt (all taken in August). (6) *Lysandra bellargus* Rott., ♂ underside *impuncta* Tutt, June, and ♀ upperside, all wings suffused with blue. September. All insects from Hampshire, except one *euphrosyne* from Surrey.

Mr. A. W. RICHARDS—Lepidoptera from Hampshire. (1) Bred Rhopalocera:—*Aglais urticae* L., bred July and October 1954 from local wild larvae, including ab. *polaris* Stdgr., melanic varieties and one with large lunules. One ab. *nigrocaria* Hav. bred by Mr. Edwards of Camberley. Also 4 out of 8 specimens, bred in November 1953, with

russet undersides. *Nymphalis io* L., bred August 1954 from local wild larvae, 5 abs. *belisaria* Obth. and *semi-ocellata* Frohawk, four of which came from a single brood. (2) Heterocera captured mainly during 1953-4 including melanic *Bombycia viminalis* Fab., *Erannis leucophaearia* Schiff. and *Dasychira pudibunda* L.; male *Philudoria potatoaria* L. of female coloration; *Luperina testacea* Schiff. including one unusual aberration, and series of *Agrotis clavis* Hufn., *A. exclamationis* L. and *Apatele rumicis* L.

Mr. AUSTIN RICHARDSON—(1) Insects taken, or bred from larvae taken, in Co. Kerry, 24-30.iv.1954: *Cleora cinctaria* Schiff., long series approaching more nearly to the Welsh race than to the English or Scottish; *Polia nebulosa* Hufn., ab. *pallida* Tutt; *Odontosia carmelita* Esp. first two Irish imagines, one found at rest, the other taken at light; *Orthosia gracilis* Schiff., going over when taken but one or two of the salmon-pink Scottish form; *O. gothica* L., brightly coloured; *Angerona prunaria* L., of four specimens bred two were ab. *corylaria* Thunb.; *Diacrisia sannio* L., two males with heavily marked hindwings; *Selenia bilunaria* Esp., large and richly marked; *Triphaena comes* Hb., with one ab. *rufa* Tutt; *Euphydryas aurinia* Rott. ab. *praeclara* Kane, with an underside var. showing a broad grey band between the basal area and the sub-terminal band, and two blown larvae; *Phragmatobia fuliginosa* L. var. *borealis* Staud.; *Cynia mendica* Clerck race *rustica* Hb.; *Lithophane socia* Rott. pale form; *Amathes castanea* Esp. (*neglecta* Hb.), mostly with a pale pinkish tinge but including one ab. with yellow forewings; *Euchloë cardamines* L., two females ab. *ochrea* Tutt; *Pieris napi* L., a heavily marked female; *Ectropis crepuscularia* Hb.; *Alcis repandata* L., long series including several semi-melanic specimens, very similar to the North Wales form. (2) Insects taken in Suffolk, 29.vii.-5.viii.1954. *Nonagria dissoluta* Treits., light and dark forms; *N. neurica* Hb., long series from two localities showing yellowish, reddish and fuscous forms; *Chilodes maritima* Tausch., with a specimen of ab. *wismariensis* Schmidt and two of ab. *nigrostriata* Stdgr.; *Arenostola elymi* Treits; *A. brevilinea* Fenn; *Simyra albovenosa* Goeze, long varied series; *Heliothis virescens* Hufn. (*dipsacea* L.); *Hadena lepidula* Esp. (*carpophaga* Borkh.), including several of a white form similar to those from Kent though the ground colour of the majority is rather more yellowish; *H. compta* Schiff., of which only one specimen has been taken previously in Suffolk, in 1953, male and female specimens; *Eremobia ochroleuca* Schiff.; *Cryphia perla* Schiff., striking yellow ab.; *Euxoa cursoria* Hufn., uniformly pale; *Cucullia absinthii* L., of which there appear to be no records since 1903; *Apamea oblonga* Haw. (*abjecta* Hb.), varied series taken at light and also hiding in the bird-watching hides on Havergate Island; *Spilosoma urticae* Esp., male and female; *Thymelicus lineola* Ochs.; *Plebejus argus* L., blue females well represented. (3) Insects taken or bred during 1953-4:—*Apatura iris* L., bred, Oxon.; *Euphydryas aurinia* Rott., dark ab., Glos.; *Sphinx ligustri* L. ab. *lutescens* Tutt, Glos., in which the hindwings and abdomen are pale yellowish-white and the dark markings on the forewings are lighter

than usual; *Harpyia bicuspis* Borkh., 15 males and a female taken at mercury vapour light, Staffs., with 4 blown larvae. The female arrived at 10.20 and the males between 10.45 and 11.45; *Spilosoma lutea* Hufn. ab. *fasciata* Tugw. and a specimen approaching ab. *unicolor* Homb., Devon; *Drymonia dodonaea* Schiff., a melanic ab. and a very pale specimen, Oxon., and a dark specimen, Staffs.; *Nola strigula* Schiff., Hants.; *Eilema sericea* Gregs., Caernarvonshire, chiefly from an inland moss resembling their old Lancashire habitat. Of thirty-one moths taken, 9-17.viii.54, seventeen inland and eight coastal specimens had suffused hindwings, while one inland and five coastal had clear hindwings; *Agrotis denticulata* Haw. (*cinerea* Schiff. nec Hufn.), 2 dark brown abs., Glos.; *Orthosia gracilis* Schiff., ab. with heavy sub-terminal line, Glos.; *Xylomiges conspicillaris* L. ab. *intermedia* Tutt, Glos.; *Nonagria sparganii* Esp. ab. *obsoleta* Tutt, Kent; *Leucania conigera* Schiff. ab. *suffusa* Tutt, Caern.; *L. vitellina* Hb., a Gen. I. specimen, Glos., new county record; *Anaplectoides prasina* Schiff., melanic series, bred Staffs. with a bred Glos. series for comparison. Both series were forced. *Eupithecia succenturiata* L., long varied series bred from wild larvae, Oxon.; *E. insigniata* Hb. (*consignata* Borkh.), Glos. and Hereford; *Erannis defoliaria* Clerck ab. *nigra* Band., Glos. The species has been scarce in Glos. for several years; *Menophra abruptaria* Thunb. ab. *brunneata* Tutt, London; *Cleora rhomboidaria* Schiff. ab. *rebeli* Aign., bred Kent; *Gonodontis bidentata* Clerck, melanic ab., Staffs.; *Sesia apiformis* Clerck, bred specimen and blown larva, Bucks.; *Sphecia bembeciformis* Hb., specimen found at rest at 2 p.m., Glos.; *Aegeria spheciiformis* Schiff., two specimens, Worcs.; *A. flaviventris* Stdgr., four bred Oxon. and one bred Glos., new county record; *A. muscaeformis* Esp. long series, bred Devon.

Mr. ARCHIBALD G. B. RUSSELL—*Lasiocampa quercus* L., a female lacking the pale post-median fascia. *Macrothylacia rubi* L., a melanic female. *Cryphia perla* Schiff., a melanic male. *Orthosia gracilis* Schiff., a grey specimen with the cross lines strongly defined in black. These four specimens were taken at light at Scar Bank House, Swanage. Also exhibited was a specimen of *Euplagia quadripunctaria* Poda from Newton Abbot, possibly a gynandromorph.

Mr. J. M. K. SAUNDERS—The following Lepidoptera:—(1) *Argynnis selene* Schiff. Three males (a) with suffused forewings, (b) with spotting either small or missing, (c) with pale blotch on each forewing. All Surrey, 1953-1954. (2) *Melitaea athalia* Rott. Two suffused forms, Sussex, June 1954. (3) *Euphydryas aurinia* Rott. Three males and two females, F3 generation from pairing dark male from Sussex with female ab. *praeclara* Kane. All had well marked yellow areas. (4) *Eumenis semele* L. Male with four equal sized ocelli on forewings, symmetrically spaced. (5) *Maniola jurtina* L. (a) Male underside, typical ground colour, small ocelli. (b) Male underside, deep brown ground colour. (c) Female with asymmetrical white blotches. (d) Female with large suffusion of orange. (6) *Plebejus argus* L. A very dark suffused male



underside, E. Suffolk, July 1954. (7) *Lysandra coridon* Poda, six males showing varying colour forms including abs. *pulla*, *pallidula* and *caeruleo* (All B. & L.), also three female undersides showing slight striation and one female ab. *flavescens* Tutt, all Shoreham, Sussex, 1953-1954. (8) *Ennomos autumnaria* Wernb. Four males and one female, well freckled with black. (9) Shown on behalf of Mr. D. F. Saunders of Hailsham, Sussex. *Actinotia polyodon* Clerck, taken at mercury vapour light, 30.v.1954. Plate III.

Dr. E. Scott—The following Pyralid Lepidoptera:—(1) *Agrotera nemoralis* Scop. beaten from hornbeam in a wood near Ashford, Kent, on 15.vi.1954. (2) *Calamorpha paludella* Hb. at light at Westwell, Kent, 30.viii.1954.

Mr. S. GORDON SMITH—The following Lepidoptera (where the authority is not otherwise stated the aberrations have been described and named by S. Gordon Smith):—(1) *Selenia bilunaria* Esp. The following aberrations bred between 1949 and 1954 with three exceptions of an earlier date. Origin: Cheshire, Denbighshire, Lincolnshire, Aviemore and Dublin. Abs. *exquisita*, *erythro-fasciata*, *brunneo-fasciata*, *connexa*, *superba*, *rosea*, *extrema*, *unilinearia*, *tetrafasciaria*, *nigra*, *nigrata*, *nigro-brunneata*, *glaucescens*, *dolichobalia*, *chalcascens*, *fulvo-pustulata*, *mixta*, *flavo-marginaria*, *fumata*, *rubra*, *pallida*, *v-signata*, *nigrovanellata*, *reversa*, *brunneo-pustulata* and *chionochlora*. Also abs. *ialensis* Vaughan-Roberts, *schizomedia* Vaughan-Roberts, *costijuncta* Cockayne, *braconieri* Nordström, *radiata* Boyes and *infravenosa* Boyes. (2) *Arctia caja* L. The following aberrations bred or captured between 1951 and 1954. Origin: Chester. Abs. *rubrociliata*, *nigromarginaria* (Plate IV, fig. 6), *paucimacula* (Plate IV, fig. 3), *bijuncta*, *obliterata* (Plate IV, fig. 2), *nubilata*, *septata* (Plate IV, fig. 4), *schizomacula* (Plate IV, fig. 5), *albisignata* and *quadricothurnata*. Also abs. *albociliata* Stattermayer, *nigrociliata* Hoffman, *flavosignata* Closs, *mediodeleta* Cockayne, *lueneburgensis* Mackleidt and Steinwarth, *bioculata* Sheljuzko, *nigrescens* Lambillion (Plate IV, fig. 1), *flava* Aigner, *brunnescens* Stattermayer, *consolidata* Cockayne and *discolor* Cockayne. (3) *Lasiocampa quercus* L. Series bred from an *olivaceo-fasciata* Cockerell strain, 1954. Origin: Cheshire. Abs. *poveyi* (Plate V, figs. 2 and 4), *brevipennis* (Plate V, figs. 1 and 3), also a thinly scaled specimen, another almost transparent and a female of normal male colouration.

Mr. K. A. SPENCER—Further additions to the British Agromyzidae (Dipt.):—(1) *Agromyza dipsaci* Hd., Scratch Wood, Middx., mining *Dipsacus silvestris* L., 26th June 1954. (2) *Phytobia sönnerupi* (Hg.), Scratch Wood, mining *Carex pendula* L., 4th April 1954. (3) *Liriomyza eupatorii* (Kalt.), Chippenham Fen, Cambs., mining *Eupatorium cannabinum* L., July 1954. (4) *L. impatientis* Bri., Lake Windermere, West., mining *Impatiens parviflora* L., 15th July 1954. (5) *L. valerianae* Hd., Chippenham Fen, mining *Valeriana dioica* L., 8th July 1954. (6) *L. violiphaga* Hd., Ham Street, Kent, mining *Viola* sp., 11th July 1954. (7) *Phytomyza calthivora* Hg., Corsham, Wilts., mining *Caltha*



Annual Exhibition : 30th October 1954.

*Actinotia polyodon* Clerck (Mr. J. M. K. Saunders).

(Greatly enlarged)





*palustris* L., 6th June 1954. (8) *P. calthophila* Hg., Whittlestone, Cambs., mining *Caltha palustris* L., 8th July 1954.

Mr. H. D. SWAIN—Hemiptera from the Basingstoke Canal (Proposed Nature Reserve No. 23):—(1) About 100 species of Hemiptera taken during the survey of the Basingstoke Canal between Pirbright Bridge and Frimley Green, Surrey, in the Spring and Summer of 1954. Two species, *Miris striata* L. (Heteroptera, Miridae) and *Centrotus cornutus* L. (Homoptera, Membracidae) are included from the collections of previous years. A map of the area was also included in the exhibit. (2) British Lepidoptera:—A few varieties including a melanic specimen of *Mimas tiliae* L. (Plate II, fig. 1) and newly recorded species from Putney, and one from Folkestone. The new Putney records are (1) *Apatele alni* L., (2) *Anchoscelis helvola* L., (3) *Cirrhia gilvago* Schiff. (all Agrotidae) and (4) *Ectropis extersaria* Hb. (*luridata* Borkh.) (Geometridae). The species from Folkestone is *Aegeria chrysidiformis* Esp. (Sesiidae). (3) Drawings of Hemiptera Heteroptera, Pentatomidae.

Mr. D. THORPE-YOUNG—Aberrations of British Rhopalocera and the two following Japanese species:—*Papilio helenus nicconicolens* Butler and *P. macilentus* Jans.

Mr. and Mrs. R. TUBBS—A continuation of the previous year's exhibit being an F.2 generation of the *Polyommatus icarus* Rott. of which the F.1 generation had been previously shown. The original parent taken on the island of Tresco, Isles of Scilly, in May 1953, was ab. *arcuata* Weym. The F.1 generation had shown various confluent forms e.g. abs. *arcuata*, *costajuncta* Tutt and *basiuncta* Tutt either separately or in combination. Two broods were shown of the F.2 generation—one of 7 specimens and one of 4, bred from 36 and 147 larvae respectively which had entered into hibernation in the autumn of 1953. Although the majority of the larvae hibernated successfully, progress of the larvae in the spring was excessively slow and many died. Similar minor confluent forms appeared in the F.2 generation although a rather larger number of spots were obsolete than in the first generation.

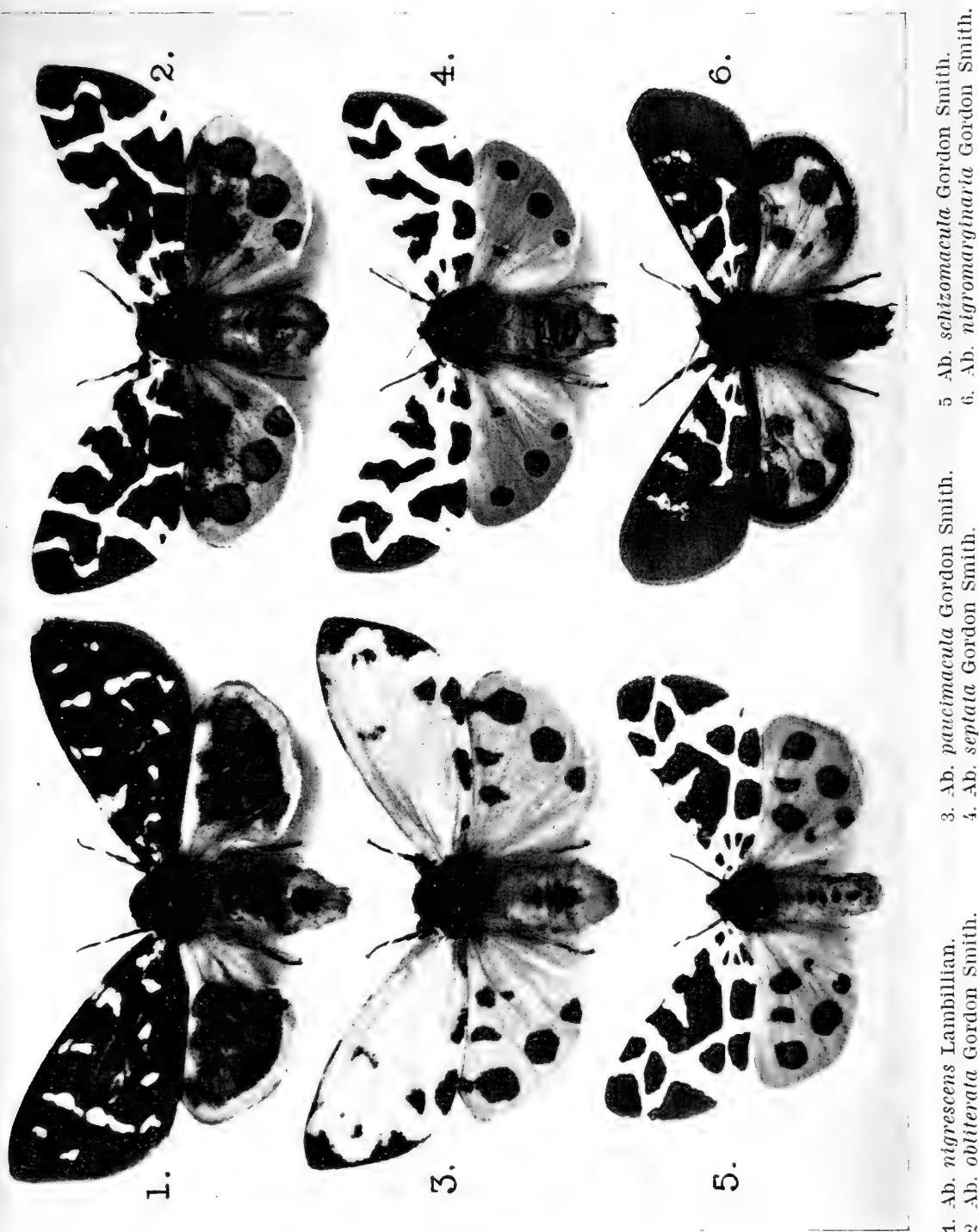
Mr. R. W. J. UFFEN—(1) Specimens of Diptera (Syrphidae) taken in London, W.6. (a) *Volucella zonaria* Poda, a ♂ taken end July 1954, and a ♀ taken 3.vii.1952; (b) *Volucella inanis*, a ♂ taken 29.vii.1954. (2) A specimen of the Hemipteron *Velia caprai* Tamanini and live examples of *Orchesella villosa* L. on which it had been fed since April.

Mr. F. T. VALLINS—An exhibit showing factors in the ecology of *Lycaeides calliopis* Boisduval (= *Lycaeides idas calliopis* Bois.), including a series of imagines, males and females, 4 pupal skins resulting from wild larvae, live ova laid on the food plant *Hippophae rhamnoides* L., and workers of the attendant ant *Formica cinerea* Mayr. The exhibit was also illustrated by photographs taken on the sites of two colonies of the butterfly, where it occurs in Hautes-Alpes, S.E. France, two photographs by Mr. S. Beaufoy of the ova, ×12 times, and drawings by Mr. A. E. Gardner from live larvae and pupae (greatly enlarged). All other known races of *L. idas* L. feed as larvae on Papilionaceae, and

it is considered that *L. calliopis* Bois., which seems to feed exclusively on Sea Buckthorn, will prove to be a good species.

Mr. S. WAKELY—A number of insects which had been taken during the year, among which were the following:—Lepidoptera—*Coleophora clypeiferella* Hofm., a species new to Britain, together with an unidentified tortrix believed to belong to the genus *Pammene*—both taken at M.V. light at Camberwell; *Tetthea ocularis* L., Camberwell, London (at M.V.), and Bookham (bred); *Pseudoips prasinana* L. (*bicolorana* Fuessl.), Camberwell (M.V.); *Earias c'orana* L., Elmers End, Kent (bred); *Atolmis rubricollis* L., Boxhill, Surrey (bred); *Setina irrorella* L., Betchworth, Surrey; *Eilema griseola* Hb., *Agrotis vestigialis* Hufn., *Lithomoia solidaginis* Hb., and *Lygephila pastinum* Treits., Byfleet, Surrey (M.V.); *Cucullia absinthii* L., Portland, Dorset (bred); *Parascotia fuliginaria* L., Oxshott, Surrey (bred); *Tholomiges turfosalis* Wocke and *Sterrrha muricata* Hufn., Chobham, Surrey; *Euphyia luctuata* Schiff., Ham Street, Kent (bred); *Bapta distinctata* H.-S., Effingham, Surrey; *Deuteronomos erosaria* Schiff., Gurnard, Isle of Wight (M.V.); *Aegeria flaviventris* Staud., near Guildford, Surrey (bred); *Anania nubilalis* Hb., Camberwell (M.V.); *Alispa angustella* Hb., Mickleham, Surrey (bred); *Nephopterix genistella* Dup., Selsey, Sussex and St. Helens, I.W., (bred); *Euzophera neophanes* Durr., Oxshott (bred); *Euenaemidophorus rhododactyla* Schiff., S.E. Essex (bred); *Alucita spilodactyla* Curt., Freshwater, I.W. (bred); *Phalonia dipoltella* Hb., Pevensey, Sussex (bred); *P. flaviciliana* Westw., Addington, Surrey (bred); *Eulia formosana* Geyer, Byfleet (M.V.); *Taspeyresia conicolana* Hegl., Horsell, Surrey (bred); *L. grossana* Haw., Camberwell (M.V.); *Platyedra vilella* Zell., Erith, Kent and St. Helens, I.W. (bred); *Sophronia semicostella* Hb., Byfleet and Camberwell (M.V.); *Mompha ochraceella* Curt. and *Borkhausenia unitella* Hb., Camberwell (M.V.); *Blastobasis decolorella* Woll., Dulwich, London; *Depressaria umbellana* Steph., Chobham (bred); *Coleophora solitariella* Zell., Benfleet, Essex (bred); *C. erigerella* Ford., Mickleham (bred); *C. salicorniae* Wocke, Shingle Street, Suffolk (bred); *Lithocolletis anderidae* Fletch., Darenth, Kent (bred); *Epermenia daucella* Pey., Freshwater, I.W. (bred); *Ypsolophus lucellus* F., Chobham; *Ethmia decemguttella* Hb., Mickleham (bred); *Leucoptera lathyri-foliella* Stt., Luccombe, I.W. (bred); *Ochsenheimeria bisontella* Zell., Barnet, Herts.; *Erivrerania kaltenbachii* Staint., Horsley, Surrey, and near Plaistow, Sussex (bred). A box of diptera (1954) was also shown and included a fine specimen of the rare *Microdon devius* L. which had been taken at Rammore by Mr. W. H. Spreadbury.

Mr. D. H. WALKER—A selection of British Rhopalocera captured in Surrey and Sussex during 1954:—*Pararge megera* L., a ♂ very heavily marked and a ♀ ab. *fascia* Frohawk. *Euchloë cardamines* L., a ♂ set as an underside showing homoeosis on both forewings. *Aglais urticae* L., a ♀ ab. *polaris* Stgr. *Polyommatus icarus* Rott., a series set as



Aberrations of *Aretia caja* L. Origin Chester.

Exhibited by Mr. S. Gordon Smith. Annual Exhibition, 30th October 1954.

Photo. W. E. Ashworth

1. Ab. *nitescens* Lambillan.  
2. Ab. *obliterata* Gordon Smith.

3. Ab. *paucimacula* Gordon Smith.  
4. Ab. *septata* Gordon Smith.

5. Ab. *schizomacula* Gordon Smith.  
6. Ab. *niptomarginaria* Gordon Smith.



undersides including abs. *obsoleta* Clark and *discoelongata* B. & L. forms also a ♀ with homoeosis, having the upperside blue markings transplanted on the underside forewing. A series of ♀ uppersides including ab. *transformis* B. & L., ab. *iphis* Meig. and a form similar to the Irish race. *Lysandra coridon* Poda, ab. *postcaeca* B. & L., a series of 4 females, one showing colour leakage, also a ♂ *anticaeeca* B. & L. *Maniola tithonus* L., a series of males showing variation in the extent of the sexual brand.

Mr. NORMAN A. WATKINS—(1) A series consisting of a large number of named aberrations of *Lysandra coridon* Poda taken in Wiltshire 1954 including the following:—♂ uppersides—abs. *inframarginata* B. & L. (27), *marginata* Tutt (18), *cuneata* Tutt (1), *inframelaina* B. & L. (4), *melaina* Tutt (2), *atrescens* Tutt + *metallica* B. & L. (4) including an extreme form with much black and very sparse and scattered blue scaling, *viridescens* Tutt (2), *caeruleo* Tutt (1), *lavendula* B. & L. (1), *metallica* B. & L.: a series of 35 showing colour variation through *caeruleo*, *lavendula* and *viridescens* to *grisea* Tutt, and *punctata* Tutt, *inframarginata*, etc., *fowleri* South (2). ♂ undersides—abs. *ultra-fowleri* B. & L. (2) including an extreme form with huge white spots on all wings against a darkish grey ground-colour, *anticaeeca* B. & L., *caeca* Courv. and *postcaeca* B. & L. (8), *juncta* Tutt (2) and *antijuncta* B. & L. (1). ♀ uppersides—abs. *syngrapha* Kef. (1), *semisyngrapha* Tutt (3), *infra-semisyngrapha* B. & L. and *radiosa* Gaschet (15), *roystonensis* Pickett (1), *inaequalis* Tutt (2), *partimtransformis* B. & L. two separate forms:—one with two wings broken up by broad buff wedges and streaks (1) and the other with narrow streaks of white scaling through the discoidal (3), *glabrata* Tutt (1), *antiaurantiaextensa* B. & L. (1) an extreme form with the orange lunules of the forewing joined to the discoidal by orange scaling between nervures 2 and 3. ♀ underside—abs. *discreta* Tutt, *juncta* Tutt, *confluentiae* Courv., *discoelongata* Courv. (2) A series of *Aglais urticae* L. (14). Bred from wild larvae, Somerset, 1954, including dark forms, forms with bleached patches, one rayed and two melanic undersides. Also a pale ♂ with partially melanic hindwings and elongated mauve wedges, and a melanic ♀ with partially black hindwings and considerable black scaling joining the costal spots. (3) *Agapetes galathea* L. (3), a melanic ♂, Wilts., 24.vii.1954; a ♂ with all white markings well-developed, Somerset, 18.vii.1954; and a ♂ underside with all black markings reduced and pale in colour, Somerset, 15.vii.1954.

Mr. R. W. and Mrs. N. I. WATSON—(1) (a) *Melitaea cinxia* L., from inbred stock. (b) *Euphydryas aurinia* Rott, bred, Hod Hill, Dorset. (2) *Thecla betulae* L., bred, New Forest. (3) (a) *Hyloicus pinastri* L., bred, New Forest. (b) *Lymantria monacha* L., bred, New Forest. (c) *Dasychira fascelina* L., bred, Studland, Dorset. (d) *Arctia caja* L., bred, Southampton.

Mr. W. J. WATTS—Coleoptera—A cabinet drawer showing the British species of *Cryptocephalus* Geoffroy and *Cyclicinae* (Chrysomelidae).

Mr. R. D. WEAL—Coleoptera:—(1) The first four draws of the collection of Coleoptera made by Mr. W. West (Greenwich) containing the Carabidae. (2) An exhibit illustrating the differences and likenesses in tunnels and emergence holes made in woodwork of houses by the following species, usually known as Woodworm: *Lyctus brunneus* Steph., Leyton, March 1954. *Anobium punctatum* Deg., specimens of adult and portion of wood from a staircase, Leyton, 27.x.1953. *Pentarthrum huttoni* Woll, specimens of adult and portion of wood from floor, Leyton, 25.x.1954. *Euophryum confine* Broun, specimens of adult and portion of wood from floor joist, Leyton, 18.xi.1953. *E. rufum* Broun, specimens and wood from floor, Chingford, October 1950. *Caulotrumpis aeneopiceus* Boh., specimens and wood from floor, Leyton, 18.xi.1953.

Mr. L. S. WHICHER—About one hundred and thirty foreign species of the Scarabaeid sub-family Aphodiinae.

Mr. G. F. C. WOOLLETT—Series of bred *Euphydryas aurinia* Rott., both male and female, a few varieties of *Maniola tithonus* L., some interesting varieties of *Plebejus argus* L. and a few *Lysandra coridon* Poda and *Maniola jurtina* L., all taken in Surrey and Sussex.

BARON DE WORMS—(1) Rhopalocera:—(A) A Series of *Euphydryas aurinia* Rott. showing the variation from four localities. Hodd Hill, Dorset; Carlisle; Dublin area and the Leigh Woods, Bristol. (B) A series of *Maniola jurtina* L. s.sp. *iernes* Graves taken in the Burren, Co. Clare, showing, in particular, extended orange patches on the upper-sides of the male examples. (C) A series of *Eumenis semele* L. taken in the Burren, Co. Clare, showing very bright blue-grey on the undersides. (2) Heterocera:—(A) A selection taken in August 1954 in the Burren, Co. Clare, at Tranmore, Co. Waterford (T) and at Rosslare, Co. Wexford (R) of the following 20 species:—*Setina irrorella* L., *Apatele euphorbiae* Schiff., *Euxoa tritici* L. (R.), *Agrotis trux* Hb. (T), *Apamea furva* Schiff., *Cerapteryx graminis* L., *Procus furuncula* Schiff. (R), a series of twenty *Calamia tridens* Hufn (= *Luceria virens* L.), *Cidaria fulvata* Forst., *Ortholitha chenopodiata* L., *Perizoma blandiata* Schiff., *P. minorata* Treits., *Anaitis plagiata* L., *Epirrhoë tristata* L., *E. alternata* Müll., *Lyncometra ocellata* L., *Colostygia salicata* Hb., *Gnophos myrtillata* Thunb., *Selidosema brunnearia* Vill., *Aspitates gilvaria* Schiff. (B) A selection taken and bred during 1954 (excluding Eire):—(1) *Dasychira fascelina* L., from Horsell. (2) *Tethea fluctuosa* Hb., from Tilgate Forest. (3) *Apatele aceris* L., from Horsell including some very dark specimens. (4) *Eilema deplana* Esp., from the New Forest. (5) *Pseudoips prasinana* L. (*bicolorana* Fuessl.), from Horsell. (6) *Chaonia ruficornis* Hufn., from Horsell. (7) *Lasiocampa trifolii* Schiff., males, yellow form, from Dungeness. (8) *Hadena suasa* Schiff., long series



1 & 3, Ab. *brevipennis* Gordon Smith; 2 & 4, Ab. *poveyi* Gordon Smith.

Photo. W. E. Ashworth.





from Southwold with dark forms. (9) *Gypsites leucographa* Schiff., some bred from Surrey and Witherslack and others taken in Forest of Dean. (10) *Orthosia gracilis* Schiff., red form bred from New Forest. (11) *Arenostola elymi* Treits., from Southwold. (12) *A. fluxa* Hb., long series from near Cambridge. (13) *Leucania faveolor* Barrett, West Wittering. (14) *L. litoralis* Curt., West Wittering. (15) *L. putrescens* Hb., from Torquay. (16) *Jodia croceago* Schiff., bred from Chiddingfold. (17) *Plusia festucae* L., from York, Eastbourne and Horsell. (18) *Cosymbia pendularia* Cl. (*orbicularia* Hb.), bred from New Forest. (19) *Euphyia luctuata* Schiff., series bred from Kent. (20) *Euchoeca nebulata* Scop., from York. (3) Rare species and aberrations of British Lepidoptera taken and bred during 1954:—(a) *Pieris napi* L., a very heavily-marked female from Tramore, Eire. (b) *Drymonia dodonaea* Schiff. (*trimacula* Esp.), two males with melanic bodies from Horsell. (c) *Spilosoma lubricipeda* L. (*menthastri* Esp.), a very lightly marked female. (d) *Lasiocampa trifolii* Schiff., a pale yellow male (from Dungeness) with the cross-lines absent. (e) *Malacosoma neustria* L., a female with the cross-lines converging, bred from Canvey Island. (f) *Agrotis exclamationis* L., a female with black patch on forewings and a very pale male, both from Horsell. (g) *A. vestigialis* Rott., a very dark male from Horsell. (h) *Lampra fimbriata* Schreber, a very dark and suffused example from Horsell. (i) *Amphipyra pyramidea* L., a very dark and heavily marked specimen from East Kent. (j) *Calophasia lunula* Hufn., a short series bred from Eastbourne. (k) *Dysstroma citrata* L., a very pale example with white ground from Newtonmore. (l) *Crocallis elinguarua* L., a remarkable example with heavy cross-lines on a pale ground taken in the Burren, Co. Clare, Eire. (m) *Oporinia dilutata* Schiff., two females with heavy cross bands, taken at Horsell in November 1953. (n) *Alcis repandata* L., a striking ab. *conversaria* Hb. from the New Forest. (4) A selection of Butterflies taken in the Upper Rhone Valley (RV) and near Paris (P) in June 1954, including the following species:—*Melitaea athalia* Rott. (RV), *M. cinxia* L. (RV), *Euphydryas aurinia* Rott. (P), *E. maturna* L. (P), *Erebia triarius* de Prun. (RV), *Coenonympha arcania* L. (P), *Pararge hiera* Hb. (RV), *Hamearis lucina* L. (RV), *Plebejus lycidas* Trapp. (RV), *Polyommatus icarus* Rott. (RV), *P. thersites* Chapman (RV), *P. hylas* Esp. (RV), *Lysandra bellargus* Rott. (RV), *Aricia eumedon* Esp. (RV), *Cyaniris semiargus* Rott. (RV), *Pyrgus carthami* Hb. (RV), *P. serratulae* Ramb. (RV).

Mr. L. D. YOUNG—(1) *Argynnis euphrosyne* L. A straw coloured ♂ and a melanic ♀, Surrey, May 1941. (2) *Aricia agestis* Schiff. ab. *graafii* ver Huell, ♀, and a ♂ underside with black lunules, Surrey, August 1953. (3) *Polyommatus icarus* Rott., a ♀ ab. *striata* Tutt, Surrey, July 1939. (4) *Lysandra coridon* Poda, a ♀ with gynandrous marking on left forewing, Sussex, August 1954, and a ♀ ab. *ultra nubila* B. & L. + *fumidescens* B. & L., Sussex, August 1939. (5) *Thecla quercus* L., a ♀ with extremely wide white band on hindwings, bred, Ashted, 1952. (6) *Erynnis tages* L., a ♀ forewing variation, Surrey, May 1952.

10th NOVEMBER 1954.

The PRESIDENT in the Chair.

The death of Captain P. E. N. Hitchins was announced. Mr. B. McD. Gerard was declared elected a member.

EXHIBITS.

Mr. T. R. EAGLES—Larvae, pupae and imagines of *Rivula sericealis* Scop. bred from ova from Horsham, Sussex.

Messrs. W. H. SPREADBURY, H. G. TUNSTALL and T. R. EAGLES—A collection of fungi made the previous day at Oxshott Common, Surrey.

COMMUNICATION.

Mr. W. H. SPREADBURY gave an extempore talk on the larger British Fungi.

24th NOVEMBER 1954.

The PRESIDENT in the Chair.

Messrs. J. W. Beard, G. B. Bransby, J. Clark, P. J. M. Robinson, B.Sc., A.M.I.C.E., G. B. Rogers, A. J. Showler, M.Sc., were declared elected members.

The Secretary read the names of the members recommended by the Council to fill the various offices or to be Ordinary Members of Council for 1955-56.

There was a discussion on the Annual Exhibition.

8th DECEMBER 1954.

The PRESIDENT in the Chair.

The Chairman announced the award of the Darwin Medal by the Royal Society to Dr. E. B. Ford.

EXHIBITS.

Dr. B. P. MOORE—A collection of Carabidae (Col.) to illustrate his paper.

Mr. F. D. BUCK—Eight species of Carabidae (Col.) taken by Dr. Wallace Peters in Kenya during 1951/2. (1) *Anthia pulcherrima* F. (2) *Pheropsophus kersteni* Gerst., a typical Brachinid even though the elytra are a little more abbreviated than usual. (3) *Arsinoe egregia* Pér. (4) *Clivina grandis* Dej. (5) *Rhysotrachelus quadrimaculatus* Boh. (6) *Metagonum gilvipes* Boh. (7) A *Lebia* species which is not represented in the Gen. Col. B.M. (Nat. Hist.). (8) *Drypta* species represented in the Gen. Col. B.M. (Nat. Hist.) by a series of a dozen or so examples which are not determined.

Mr. A. E. GARDNER—Odonata:—A male and a female *Sympetrum danae* Sulz. which were seen in numbers with the Silver Y Moth, *Plusia gamma* L., during the night of 6th-7th September 1954, at Tory Island Lighthouse, N.W. Ireland.

Mr. G. C. D. GRIFFITHS—Two additions to the British List of Agromyzidae (Dipt.):—(1) *Phytomyza corvimontana* Hering, a miner of *Achillea ptarmica* L. Larvae taken at Scratch Wood, Middlesex, 3rd October 1954. Imago emerged 25th Oct. (2) *Phytagromyza anteposita* Strobl., taken at Darenth Woods, Kent, 9th May 1954. Host unknown.

Mr. R. W. J. UFFEN—A specimen of *Syrphus diaphanus* Zett. (Dipt.) taken on *Heracleum sphondylium* L. at Wimbledon Common, Surrey, 20th July 1954. Also examples of common species which might be confused with it.

#### COMMUNICATION.

Dr. B. P. Moore read a paper, illustrated by the lantern, "An Introduction to the British Carabidae". (See Trans.)

12th JANUARY 1955.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. F. D. BUCK—Specimens of a new genus of Australian Cistelid beetles which included two new species, all as yet undescribed. Also specimens of an allied genus.

Mr. T. J. HONEYBOURNE—A sprig of *Crataegus grignonensis* Mouill. which still retained its leaves. This evergreen and almost thornless hawthorn is valuable for rearing larvae of exotic Lepidoptera.

Mr. R. F. HAYNES—A photograph of larvae of *Herse convolvuli* L. reared from eggs laid by a female taken at Salisbury, Wilts., 7th September 1954.

Mr. A. E. GARDNER—Orthoptera:—The following Acrididae taken by Dr. W. Peters in Liberia during 1953: *Gastrimargus amplus* Sjöstedt, *Stenocrobylus festivus* Karsh and *Orbillus coeruleus* Drury. Also a specimen of the Desert Locust *Schistocera gregaria* Fors.

#### COMMUNICATIONS.

The PRESIDENT had recently found 3 specimens of the moth *Depressaria applana* F. in a coke bin at his house.

Lantern slides were shown by BARON DE WORMS, Mr. W. H. SPREADBURY and Mr. R. F. HAYNES and by the SECRETARY on behalf of Dr. H. B. D. Kettlewell.

26th JANUARY 1955

#### 83rd ANNUAL MEETING

(with which was combined the Ordinary Meeting).

Mr. S. N. A. JACOBS, S.B.St.J., F.R.E.S., President, in the Chair.

The death of Mr. V. E. August was announced.

Mr. D. P. L. Matthews, T.D., was declared elected a member.

Reports of the Council and Treasurer were read and adopted.

The following members were declared elected as Honorary Officers and Council for the ensuing twelve months:—*President*—F. D. Buck. *Vice-Presidents*—S. N. A. Jacobs, S.B.St.J., F.R.E.S.; Lt.-Col. W. B. L. Manley, F.R.E.S. *Treasurer*—J. L. Henderson. *Secretary*—F. T. Vallins, A.O.I.I., F.R.E.S. *Editor*—T. R. Eagles. *Curator*—A. E. Gardner, F.R.E.S. *Librarian*—T. R. Eagles. *Lanternist*—H. E. Webb, F.R.E.S. *Council*—E. W. Classey, F.R.E.S.; R. M. Mere, F.R.E.S.; B. P. Moore, Ph.D., B.Sc., F.R.E.S.; J. L. Newton, M.R.C.S., L.R.C.P., F.R.E.S.; Prof. O. W. Richards, M.A., D.Sc., F.R.E.S.; W. H. Spreadbury; F. Stanley-Smith, F.R.E.S.; H. G. Tunstall; R. S. Tubbs, O.B.E., A.R.I.B.A.; S. Wakely.

#### EXHIBITS.

Mr. A. H. SPERRING—A series of aberrant forms of *Zygaena trifolii* Esp.

Mr. R. F. HAYNES—A gynandromorphic *Maniola jurtina* L. caught by him July 1954 at Kincasslagh, Co. Donegal, Ireland.

Mr. A. E. GARDNER—The following Orthoptera:—Living specimens of the German Cockroach *Blatella germanica* L. from Kingston, Surrey; Latreille's Locust *Tropidacris latreilli* Perty from Brazil. The latter has a wing span of  $9\frac{1}{4}$  inches.

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26th JANUARY 1955.

#### PRESIDENT'S ADDRESS.

Read by Mr. S. N. A. JACOBS.

From the Council's and Treasurer's reports you have heard that the position of the Society is still worthy of a feeling of satisfaction in the hearts of members, and it will be seen that the raising of subscriptions in the previous year has produced the desired result. It is true that some members have found it a burden, and have resigned, and to these I extend the hope that their circumstances will soon improve and that they will be able to rejoin the Society in the near future.

The deaths mentioned in the Council's report include J. A. Walker, who joined us in 1946 and whose interest was in the Lepidoptera, including the "micros"; he was a keen member, although his residence in Somerset precluded him from regular attendance at meetings.

Col. P. A. Cardew, who was a member from 1909 until 1922, and who rejoined us in 1937, was President in 1948 and a very regular member of the Council. He was a lepidopterist whose long field experience enabled him to communicate many interesting notes.

E. Barton White was a fairly new member, having joined in 1945, and residing in Devonshire naturally prevented regular attendance at meetings although he too was a keen lepidopterist who was always pleased to meet members when visiting his vicinity.

T. L. Barnett, who died on the 6th June, was one of our honorary members; he joined the Society on the 26th November 1896, and was a

survival of that splendid race of "artisan entomologists" who did such valuable field work, and who took such keen interest in making their own apparatus and cabinets. He was an active field worker until ill health in the last year or two of his life caused him to cease attending our field meetings and his great fund of field experience was always at the disposal of those who sought it. His main interest was in the lepidoptera, but he also dealt at various times with Coleoptera and other orders; he was also an experienced horticulturalist.

Capt. P. E. N. Hitchins joined the society in 1944; he was interested in entomology generally and, being an accepted authority on the commercial growing of tomatoes and author of much literature on the subject, married his pleasure with his business especially where insect pests were concerned. He was well known to members working west Sussex.

V. E. August has died on the 22nd January in hospital, following an operation. He joined the Society in 1936, and was very regular in his attendance at meetings. His interest was mainly in the breeding of insects without any special limits as to order.

I would ask you to stand for a few moments in remembrance of these friends no longer among us.

Three members of the Society have been honoured in the season; Mr. A. G. B. Russell being appointed Clarenceux King at Arms, and Dr. E. B. Ford being awarded the Darwin Medal by the Royal Society, in recognition of his work on genetics. Dr. E. A. Cockayne received the O.B.E. for his services to Entomology.

The regrettable separation of the Society from its library and collections, even though it be only temporary, is a matter which we all hope the not too distant future will rectify. Your Council has devoted much time to the investigation of various possibilities, and your Secretary has been indefatigable in his efforts to arrange suitable accommodation both for the meetings and collections, but nothing really satisfactory has so far been found. Other quarters could of course be found, but we would still be separated from library and collections, and as in such circumstances our comfort would not have been such as we are at present enjoying, it has been decided that it will be better that we remain as we are until something really suitable in all respects has been found.

Members with material for identification can always bring it to meetings where opinions can be sought, and Mr. Wakely has undertaken to send books to members by post (of course at their expense both ways) on request. In this connection, it will be appreciated that certain of the Society's rarer items cannot be dealt with in this way, for fear of accident in the post. The simple way would be to collect the books from Mr. Wakely at meetings, returning them at a later meeting.

A matter which may come before your council at a not too far distant date is the name of the Society; it has been mentioned in many quarters that the present name no longer describes the activities of the Society as it implies too local interests. The spread of membership

(Country members now exceed full members in numbers) would seem to call for some style which would embrace all members at home and abroad, and suggestions would be welcomed by your secretary. Our present localized name might, it is thought, prejudice our position when considered by people or bodies without first hand knowledge of our activities.

The field work done by members reflects considerable credit on those concerned, and beside the surveys undertaken on behalf of the Nature Conservancy, which despite the poor season have produced useful reports for that body, an outstanding example of concerted effort was the investigation of *Hydraecia hucherardi*, the life history of the species being hitherto unknown. It is no mean achievement that so much new information on the subject should have been discovered within so short a time of the insect's first appearance in this country.

Much work has also been undertaken with the small Agromyzid flies, and several new species have been added to the British list, with one or two new to science. The occurrence of rare species has been watched, and, I am glad to say, treated with restraint, so that if the "scientifically minded" agriculturists do not decide to broadcast insecticide in the vicinity of the first footholds of these species in this country, there is every chance of the continued growth of these colonies.

While touching on the matter of insecticides, I think it only right to raise my voice in condemnation of the unintelligent use so often made of these new chemicals, and I attribute the frightening reduction of insect life, both here and on the continent during the past few years, in no small measure to this cause. The matter can, of course, be expanded and laced up with other subjects, but I suggest that the main cause of the trouble is the over-specialization of knowledge and the modern tendency to sacrifice early education to the somewhat doubtful deity of learning.

In rectifying this lop-sidedness, I submit that amateur scientific societies play an important part, for membership of such a society presupposes a love of the subject concerned which brings the human side and the purely scientific side into a union which is beneficial to both amateur and professional.

Members would help matters by protesting as often as possible against the indiscriminate use of insecticides, for many beneficial and neutral species must necessarily be destroyed in the attack on what is often a minor infestation by pests. Here, it must be stressed that extermination in nearly all, if not in all, cases, is wholly undesirable in the light of long-term consequences.

I can see the day when the reduction of insects will have reached the point where the farmer will be forced to fertilize his trees by the employment of rabbit tails, as is customary in glass-house culture. He will probably then be faced with the fact that some other scientist has in the meantime exterminated rabbits which would have provided the necessary tails!

For the second part of my address, I have completed my monograph of the *British Oecophoridae*, but as this would be quite unreadable at such a meeting, I would like to take up a little more of your time in outlining the progress made with the series of papers on the British *Tinaeina*, *sensu lato*, undertaken by members with the ultimate intention of reprinting them as a book on the subject, which is long overdue.

So far, papers have appeared covering the *Momphidae*, *Oecophoridae*, *Orneodidae*, *Heliozelidae*, *Choreutidae*, *Aegeriidae*, *Gracillariidae* (*Caloptilia* and *Lithocolletis*), *Lyonetidae*, *Plutellidae* (ex *Argyresthia*), *Psychidae*, *Lamproniidae* and *Adelidae*.

Help is earnestly sought from members capable of dealing with other families, with or without accompanying plates. For obvious reasons it is more desirable that these papers should be accompanied by a plate, and where the writer is unable to find his own illustrator, I will do my best to fill the gap.

The families mentioned form a good skeleton on which to develop the work, and my present view is that efforts should be concentrated on the *Gelechiidae* so that when this family is covered, it will be possible to produce the first volume, say to the end of the *Glyphipterigidae*, and leave the outstanding families from the rest of the super-family for treatment at a later date, although in this we should not be dogmatic, for coverage of any family is a useful step towards the completion of the work.

It is inevitable that small families will be found to have been excluded from between these "group" papers, but these can be collected into plates which could be included not too far from the descriptions.

Members will not need to be reminded that to keep this work up to date, it should be based on the authors' own descriptions where possible, and should not be just a transcription of Meyrick or other works. No work is devoid of mistakes, but no progress is made if these are perpetuated in subsequent works, as has happened so many times in the past.

The style most desirable is one which can be followed by the amateur, and also be of use to the professional to fill gaps between the exhaustive scientific papers published in very many different places, and inaccessible for the most part, to amateurs. It is still possible that a popular work on the *Tortricina* may be produced commercially but it is hardly likely that a work on the *Tineina* would command a large enough sale quickly enough to justify publication as a commercial enterprise.

I trust that in foreshortening my address in this manner I am not setting a bad example to future presidents and I fully expect that many present will experience a feeling of relief that I have done so.

The load which one is apt to think should lie on the shoulders of a president has been lightened considerably, if not entirely removed, by the untiring help given by our secretary, officers and council, and I am left with the feeling that it has been all too easy.



I have now only to perform the last task of my year in the office with which you have honoured me, and it is with great pleasure that I ask Mr. F. D. Buck to take the Chair for the coming year. Mr Buck agreed to take over the Vice-Presidency from Mr. E. E. Syms, your President Designate, who, for reasons beyond his control, has asked to be relieved of the office, and we are fortunate that your new president, unanimously elected by your council, was willing to fill the gap. You will need no reminder of Mr. Buck's energy in preparing such frequent and interesting exhibits and notes on Coleoptera, and it is also good that you should once more have a coleopterist in the Chair. I wish him the pleasure which I have experienced during my year of office, derived wholly from the friendly atmosphere of this society and loyal co-operation of the Officers and Council which cannot be too highly praised.

### ON THE BRITISH OECOPHORIDAE (LEP. TIN.) III.

(This paper, with which there is a coloured plate, is part of the Presidential Address read on 26th January 1955 by Mr. S. N. A. Jacobs, S.B.St.J., F.R.E.S. It is intended to read continuously from the end of Part II, *Proc. S. Lond. ent. nat. Hist. Soc.*, 1949-50, p. 203.)

#### DEPRESSARIA.

##### Group B: *Depressaria* Haw.

Forewings with 2 and 3 stalked, base paler with dark vertical line separating light area from rest of wing. Most species vary in intensity of colouring but the wing pattern is generally constant. The forewings of this group tend to be angular at the apex as opposed to the more rounded termen of *Agonopteryx*.

#### Key to Species.

- |   |     |     |     |     |                       |   |
|---|-----|-----|-----|-----|-----------------------|---|
| 1. Apex sub-falcate                                 | ... | ... | ... | ... | <i>costosa</i>        |   |
| Apex otherwise                                      | ... | ... | ... | ... |                       | 2 |
| 2. Forewings with nervures clearly dark-lined       |     |     |     |     |                       | 3 |
| Forewings otherwise                                 | ... | ... | ... | ... |                       | 4 |
| 3. A dark ringed white discal dot at $\frac{1}{2}$  | ... |     |     |     | <i>putridella</i>     |   |
| Without such dot                                    | ... | ... | ... | ... | <i>umbellana</i>      |   |
| 4. Forewings with ground colour pale yellowish buff | ... | ... | ... | ... |                       | 5 |
| Forewings otherwise                                 | ... | ... | ... | ... |                       | 6 |
| 5. Forewings more yellowish, rusty marked           | ... |     |     |     | <i>liturella</i>      |   |
| Forewings more buff, marks not rusty                | ... |     |     |     | <i>pallorella</i>     |   |
| 6. Forewings with red mark in cell                  | ... | ... |     |     |                       | 7 |
| Forewings otherwise                                 | ... | ... | ... | ... |                       | 8 |
| 7. Red mark enveloping white dot                    | ... | ... |     |     | <i>ocellana</i>       |   |
| Red mark not enveloping white dot                   | ... |     |     |     | <i>alstroemeriana</i> |   |

## Key to Species.

8. Forewings with round dark discal spot ...		9
Forewings otherwise ... ..		10
9. A black dot beyond discal spot ... ..	<i>arenella</i>	
No dot beyond discal spot ... ..	<i>propinquella</i>	
10. First pair of dots more or less joined into an angulated stigma ... ..		11
First pair of dots clearly separate ... ..		13
11. Ground colour silvery grey ... ..	<i>ciniflonella</i>	
Ground colour otherwise ... ..		12
12. Thorax buff ... ..	<i>hypericella</i>	
Thorax not buff ... ..	<i>conterminella</i>	
13. Expanse less than 15 mm. ... ..		14
Expanse more than 15 mm. ... ..		16
14. Forewings with white discal dots ... ..	<i>capreolella</i>	
Forewings without white discal dot ... ..		15
15. Forewings purplish brown, costa lighter ...	<i>purpurea</i>	
Forewings uniform greyish ochreous ...	<i>rotundella</i>	
16. Forewings brownish orange ... ..		17
Forewings otherwise ... ..		18
17. Forewings with tornus bounded by blackish V-shaped suffusion ... ..	<i>angelicella</i>	
Forewings without such suffusion ... ..	<i>carduella</i>	
18. Forewings finely brindled ... ..		19
Forewings plain or patterned ... ..		23
19. Nervure ends clearly dotted fuscous on costa and termen ... ..	<i>zephyrella</i>	
Forewings otherwise ... ..		20
20. Expanse under 17 mm. ... ..	<i>nanatella</i>	
Expanse over 18 mm. ... ..		21
21. Forewings with ground more or less evenly coloured ... ..	<i>subpropinquella</i>	
Forewings with costa lighter than dorsum		22
22. Cilia of forewings pink round apex ...	<i>atomella</i>	
Cilia of forewings not pink edged ... ..	<i>assimilella</i>	
23. Forewings with one white dot ... ..		24
Forewings with more than one white dot ...		27
24. A curved dark streak from dot to anal angle	<i>astrantiac</i>	
No such streak ... ..		25
25. Forewings almost uniform chocolate-fuscous	<i>hepatariella</i>	
Forewings otherwise ... ..		26
26. Inner black dots distally edged whitish ...	<i>applana</i>	
Inner black dots not so edged ... ..	<i>yeatiana</i>	
27. Pale basal area confined to base ... ..	<i>cnicella</i>	
Pale basal area extended along costa ...	<i>ciliella</i>	

1. *Depressaria costosa* Haw. Exp. 23 mm. Face pale buff, crown with erect buff scales; Palpi apical joint buff, ringed sooty brown at about  $\frac{2}{3}$ , middle joint buff, brindled sooty brown. Scape buff with forward edge sooty brown. Antennae buff, closely ringed sooty brown, giving a bronzy sheen. Thorax and tegulae buff, a transverse crest towards rear of Thorax. Abdomen buff lightly brindled brown; a pinkish bronzy sheen, anal tuft buff; ventrally with four dark dots on posterior edge of segments, the outer pair being darker. Forelegs buff brindled sooty brown, last three joints of tarsi sooty brown; Middle and Hind legs buff, brindled slightly darker reddish buff. Forewings pale buff, brindled brownish on centre of disc and at tornus, a small black dot on centre line of disc at about  $\frac{1}{3}$  followed by two red dots, one just before and the other just after  $\frac{1}{2}$ , a blackish blotch above these red dots. Nervures dotted with blackish scales and costa obscurely barred with blackish scales; cilia rich purple brown at apex and termen, lightening to buff at anal angle. Hindwings pale buff, darkening slightly towards anal angle and apex; nervures slightly marked purple brown; cilia whitish buff, dusky with pinkish sheen at apex.

Larva greyish green with slightly darker dorsal and subdorsal lines, finely dotted with blackish warts. Head and plates black; Meyrick mentions *Ulex*, *Cytisus* and *Genista* in light web on young shoots, V-VI. *Sarothamnus*; in light web on young shoots, V-VI.

Imago common in England, South Scotland and Ireland; abroad from Sweden to Dalmatia and across to Asia Minor; also recorded from British Columbia, sp. probably also across Asia. VII-VIII.

2. *Depressaria umbellana* Steph. Exp. 21 mm.; Face pale greyish buff, Crown yellowish buff, darker round eyes. Palpi apical joint light brownish buff finely tipped black, middle joint whitish buff mixed brown and sepia on sides, light brownish below. Scape dark sepia basally, light brownish buff apically. Antennae about  $\frac{2}{3}$ , slightly bronzy brown. Thorax light brownish buff, sepia central line; anterior scales brown-edged darkening laterally. Tegulae light brownish buff. Abdomen light brownish buff brindled darker; segments paler laterally and posteriorly. Anal tuft yellowish ochreous. Legs light greyish buff, forelegs with tibiae dark scaled inwardly, terminal two joints of tarsi blackish. Hind pair with dark sepia spurs. Forewings light buff with slightly pinkish tinge, nervures lined fuscous brown; base of costa dark sepia, a small dark dash near base of 12. Two dark sepia dots on disc at about  $\frac{1}{4}$ , termen dotted blackish sepia at nervure ends. Cilia as forewings, basally and apically brindled fuscous. Hindwings light purplish grey darker at apex; dark sepia on margin between apical nervures; cilia yellowish, very lightly brindled fuscous basally.

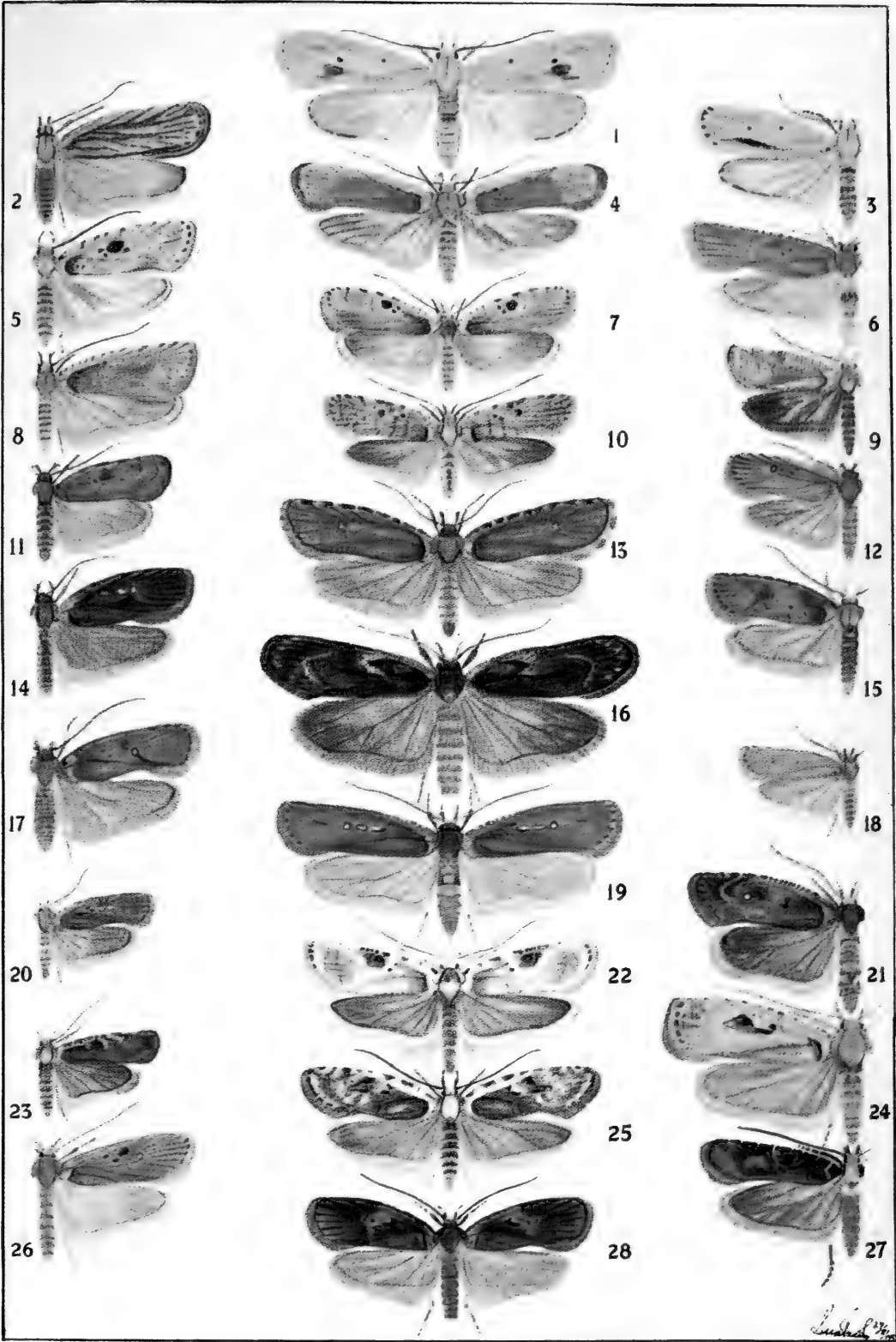
Larva dull green, head, plates and dots black. In silken tubes on young shoots of *Ulex*. VI-VII.

England, Wales and Southern Scotland; abroad in Holland, France and Spain. Apparently not recorded elsewhere. VIII-IV.

3. *Depressaria liturella* Schiff. Exp. 22 mm. Head face pale buff, crown rough-scaled, buff. Palpi apical joint pale buff, middle joint



- 1 *Depressaria liturella* Schiff.
- 2 *Depressaria umbellana* Steph.
- 3 *Depressaria pallorella* Zell.
- 4 *Depressaria atomella* Schiff.
- 5 *Depressaria arenella* Schiff.
- 6 *Depressaria subpropinquella* Stt.
- 7 *Depressaria propinquella* Treits.
- 8 *Depressaria assimilella* Treits.
- 9 *Depressaria nanatella* Stt.
- 10 *Depressaria zephyrella* Hb.
- 11 *Depressaria carduella* Hb.
- 12 *Depressaria putridella* Schiff.
- 13 *Depressaria hepatoriella* Zell.
- 14 *Depressaria cnicella* Treits.
- 15 *Depressaria angelicella* Hb.
- 16 *Agonopteryx brunneella* Rag.
- 17 *Depressaria astrantiae* Hine.
- 18 *Depressaria rotundella* Dgl.
- 19 *Depressaria ciliella* Stt.
- 20 *Depressaria capreolella* Zell.
- 21 *Depressaria applana* Fab.
- 22 *Depressaria alstroemeriana* Clerck.
- 23 *Depressaria purpurea* Haw.
- 24 *Depressaria ocellana* Fab.
- 25 *Depressaria ciniflonella* Zell.
- 26 *Depressaria yeatiana* Fab.
- 27 *Depressaria hypericella* Hb.
- 28 *Depressaria conterminella* Zell.





similar, slightly brindled darker basally. *Scape* bronzy brown brindled dark fuscous. *Antennae* bronzy brown, ringed dark fuscous. *Thorax* pale buff, orange brown central line, *Tegulae* pale buff. *Abdomen* pale buff, lightly brindled darker, caudal tuft yellowish buff. *Forelegs* purplish brown, *middle* pair greyish brown, *hind* pair buff. *Forewings* pale buff, two small black dots on disc slightly above central line, one at about  $\frac{1}{4}$ , the other slightly beyond  $\frac{1}{2}$ . An orange blotch with dark-scaled oval patch, below outer black dot. An orange streak through outer black dot and two small orange blotches above it, one midway between the dots and the other outwards from above outer dot. An oblique orange dash near base on dorsum and an orange wedge from  $\frac{1}{4}$  to  $\frac{1}{2}$  containing a few dark scales. Nervure terminations obscurely dotted black, cilia as forewings slightly lighter outwardly and at anal angle. *Hindwings* shining whitish fuscous, darkening slightly in outer half; margin with dark fuscous dashes between nervures. Cilia very pale yellowish buff slightly darker at apex.

*Larva* dark brown, head, plates and dots black; on *Centaurea* spp.; (Spuler mentions "*Centaurea* and *Scabiosa* spp. but this is probably an error for *C. scabiosa*). V-VI.

*Imago* common in England, Southern Scotland and Ireland; abroad in Sweden, Russia, Central Europe to South France, Italy, Dalmatia and Asia Minor. VII-IV.

4. *Depressaria pallorella* Zell. *Exp.* 21 mm. *Face* and *Head* pale buff, a narrow collar of erected scales. *Palpi* apical joint pale buff, middle joint slightly darker, lightly brindled dark fuscous. *Scape* fuscous. *Antennae* shining bronzy, closely ringed fuscous. *Thorax* buff, narrow brownish fuscous central line. *Tegulae* lighter buff. *Abdomen* pale buff, slightly brindled brownish, anal tuft buff. *Legs*: forelegs with femur and tibia pale buff below, dark brownish grey above, tarsi dark fuscous, last two joints considerably darker; middle as forelegs, hind pair buff, last three joints of tarsi fuscous. *Forewings* very pale whitish buff, black dots on central line of disc at about  $\frac{1}{3}$  and just past  $\frac{1}{2}$ , also at base near dorsum. Nervures obscurely marked dark brown with minute blackish dots a fuscous brindled brown streak more or less parallel to dorsum from about  $\frac{1}{4}$  to  $\frac{3}{4}$ , nervure terminations obscurely dotted dark fuscous; cilia whitish buff. *Hindwings* whitish basally, becoming slightly fuscous apically, nervures lightly marked fuscous, cilia very pale buff, narrowly darker at base.

*Larva* darkish dull green with blackish green dorsal and subdorsal lines, head brown, plates dark brown laterally, with bright patches in middle. On *Centaurea*. VI-VII.

*Imago* locally throughout England and Ireland. Abroad in Europe from Sweden to Spain. VIII-IV.

5. *Depressaria assimilella* Treits. *Exp.* 19 mm. *Head* buff, the face smooth and the crown rough scaled. *Palpi* apical joint buff, a sooty ring at about  $\frac{2}{3}$  and finely tipped black; middle joint buff, slightly brindled brownish on outer side. *Scape* buff, brindled dull brown. *Antennae* buff, closely ringed sooty brown giving bronzy appearance



with pinkish sheen. *Thorax* light brownish buff, a small blackish dot on each side, partly covered by tegulae, a crest at posterior end. *Abdomen* buff brindled brownish on dorsal surface and brindled sooty brown on ventral surface with a darker dot laterally on each segment. *Legs*: forelegs sooty brown, middle legs buff brindled sooty brown, hindlegs buff, tibiae and tarsi slightly brindled brown. *Forewings* light buff, heavily brindled brownish in all but costal and basal areas, a black dot above central line at  $\frac{1}{3}$  followed by a rusty wedge in centre of disc more or less uniformly speckled with obscure sooty brown scales; cilia brownish buff tipped sooty brown at apex. *Hindwings* whitish buff basally becoming light dull sooty brown in outer half, margin marked with sooty brown dashes between nervures, strongly at apex, and progressively less so to anal angle.

*Larva* brown or greenish grey, head and plates also warts black, on *Sarothamnus*, *Cytisus* and *Genista*. VI-VIII. Pupates in ground.

*Imago*: England, Southern Scotland and Eastern Ireland; abroad generally distributed through Western Europe to Italy and Dalmatia.

6. *Depressaria atomella* Schiff. *Exp.* 21 mm. *Head* smooth brownish buff, face lighter. *Palpi* apical joint pinkish buff, middle joint brownish buff, light inwardly, slightly brindled sooty brown outwardly. *Scape* pinkish brown brindled sooty fuscous. *Antennae* light fuscous, heavily banded sooty fuscous, the whole with a pinkish sheen. *Thorax* pinkish buff brindled brownish, posteriorly pink; tegulae similar. *Abdomen* shining greyish, dorsally sooty brown, last two segments brownish, ventrally with lateral sooty spot, anal tuft yellowish. *Legs*: forelegs brownish buff, tarsi heavily banded sooty fuscous; middle pair brownish buff, lightly banded brown, hindlegs buff. *Forewings* pinkish buff basally and costally, suffused rosy pinkish on disc, small black dot at about  $\frac{1}{3}$  on upper side of cell, sparsely dotted black over wing, nervures dotted sooty black on termen, cilia pinkish mixed light fuscous, apically tipped clear pink. *Hindwings* light brownish fuscous nervures darker, margin finely lined darker fuscous. Cilia basally light, apically darker fuscous; lighter towards anal angle.

*Larva* green with darker dorsal and sub-dorsal lines, yellowish green to yellow below sub-dorsal lines, dots black, head light brown, plates light brown darker laterally. In silken tube under distorted leaves of *Genista tinctoria*, *Cytisus* and allied plants. IV-V.

*Imago*: England to Lancashire and Ireland; abroad in Central and South Europe, Asia Minor, Syria and North Africa; somewhat local. VII-VIII.

7. *Depressaria subpropinquella* Stt. *Exp.* 21 mm. *Head*: face whitish buff, crown rough scaled, cinnamon brown. *Palpi* apical joint brownish buff, pale at tip and brindled brownish sepia at base, middle joint pale brownish buff lightly brindled brownish sepia. *Scape* pale brown distally brindled sooty. *Antennae* pinkish buff closely banded sooty brown. *Thorax* pinkish cinnamon, anteriorly darker, with posterior crest. *Tegulae* anteriorly brownish, posteriorly pinkish cinnamon. *Abdomen* pale pinkish buff, slightly brown scaled dorsally, ventrally

pale buff, more pinkish laterally with small dark spot each side of each segment. *Legs*: forelegs pale buff, femora dark sepia above, tibiae dark brindled above, tarsi banded sooty brown; middle pair, buff, brindled sooty brown; hind pair uniform pale brownish buff. *Forewings* uniform pale pinkish cinnamon lightly brindled dull brown, two small black dots slightly above centre line at  $\frac{1}{3}$ , the inner slightly higher than the outer, followed by a roundish patch of dusky scales just before  $\frac{1}{2}$ , a few scattered single blackish scales chiefly along nervures and at termen at ends of nervures; cilia pale pinkish buff brindled dull brownish. *Hindwings* pale fuscous darkening very slightly towards apex, nervures slightly brownish, apical margin lined sooty fuscous between nervures; cilia pale fuscous basally whitish, apically slightly darker; an indistinct sub-basal pale sooty fuscous line.

*Larva* light green, dorsal line slightly darker, head and plates blackish, warts as ground colour. In silken web on underside of leaves of *Cirsium*, *Carduus* and *Centaurea*. VI-VII.

*Imago*: England, South Scotland and Eastern Ireland. Abroad through Central and Southern Europe to Northern Asia Minor. VIII-IV.

8. *Depressaria arenella* Schiff. *Exp.* 20 mm. *Head*: face whitish buff, crown rough scaled dull buff. *Palpi* apical joint light buff brindled dark fuscous, centrally banded blackish and finally tipped black; middle joint light buff, outwardly brindled dark brownish. *Scape* dark fuscous, brownish buff apically. *Antennae* light fuscous, narrowly banded dark fuscous at outer extremity of each joint, giving a bronzy sheen. *Thorax* buff, brownish anteriorly, brindled fuscous and a slight posterior crest. *Tegulae* buff, dark brown anteriorly, shading off posteriorly to ground colour. *Abdomen* whitish buff, dorsally light fuscous, ventrally as above, but heavily blackish at sides of abdominal segments 1, 2 and 3, thereafter with a dark blackish lateral dot. *Legs*: forelegs femora fuscous, tibiae buff brindled brownish above, fuscous below, tarsi with penultimate and antepenultimate joints dark fuscous, others buff, basally fuscous. Middle and hind pairs buff brindled brownish, tarsal joints buff, basally fuscous. *Forewings* pale buff, more or less suffused reddish brown, two black dots at about  $\frac{1}{4}$ , the lower on centre line, the upper slightly nearer to base, a less distinct dot on centre line at about  $\frac{1}{2}$ , a medium sized round fuscous spot above centre line between the two centre line dots, and a crescent shaped fuscous suffusion darker basally, from dorsum separating off a small basal area of the ground colour; four blackish dots on costa, nervure endings dotted blackish on termen; costal nervure ends marked fuscous, a few blackish scales on nervures; cilia whitish fuscous whitish tipped, lighter at anal angle. *Hindwings* whitish buff slightly suffused purplish fuscous darkening slightly towards apical half, nervures lightly lined fuscous, cilia buff with sub-apical fuscous line, lighter towards anal angle.

*Larva* yellowish green, laterally yellower, dorsal and sub-dorsal lines darker, head light brown, small circular plates on 2 black, warts black. On *Centaurea*, *Arctium* and sometimes *Carduus*; on the continent,

Lhomme also records *Carlina*, *Sonchus*, *Lappa*, *Scabiosa*, *Knautia*, and a doubtful record of *Genista*, in all cases in tubes formed by rolling or folding leaves, very common. VI-VIII.

*Imago*: England, South Scotland and Ireland; abroad Central and South Europe, Northern and Southern Russia, North Africa and California. IX-V.

9. *Depressaria propinquella* Treits. *Exp.* 16 mm. *Head*: face whitish, crown rough scaled light brown mixed whitish buff. *Palpi* apical joint buff banded basally fuscous and at middle blackish, the dark scales being extended downwards on the under side; middle joint buff, heavily brindled brownish fuscous outwardly, slightly brown on under side near apex. *Scape* dark fuscous, narrowly light fuscous distally. *Antennae* whitish grey banded light fuscous giving silvery appearance with pinkish sheen. *Legs* light fuscous, lightly brindled darker, tarsi dark fuscous on last two joints, others only slightly darker at joints. *Forewings* pale fuscous buff at base and along basal half of costa, also including the area around the two black discal dots, bordered distally by the blackish fuscous spot, otherwise suffused light dull brownish fuscous, darker bordering the light basal patch; two black dots at about  $\frac{1}{3}$ , the upper being nearer to the base, followed by a circular spot of blackish fuscous scales; costa obscurely chequered alternately black fuscous and pale fuscous buff; nervure ends dotted more or less strongly blackish at termen and a few scattered black scales on disc; cilia mixed pale and brownish fuscous, darker apically. *Hindwings* pale purplish fuscous darker in apical half, nervures obscurely fuscous, margin lightly lined fuscous, darkly so between costal nervures; cilia pale fuscous basally and sub-apically light brownish fuscous.

*Larva* dull pale green, dorsal and sub-dorsal lines darker, head and plates shiny black, plates narrowly white edged; on under surface of *Carduus* leaves. Spuler also mentions *Cirsium*, *Arctium* and *Serratula*. VI-VIII. Lhomme states that the larva hatches about 15th April and burrows under the epidermis of leaves, then makes galleries along the midrib, and pupates in the leaf or on the ground.

*Imago* locally in England and Ireland; abroad throughout Europe including Sweden and Russia to Sicily and South-West Russia.

10. *Depressaria nanatella* Stt. *Exp.* 16 mm. *Head*: face whitish buff, crown rough scaled light brownish buff. *Palpi* apical joint light brownish buff, a slight fuscous ring, stronger below, at about  $\frac{2}{3}$ , middle joint inwardly whitish buff, outwardly buff lightly brindled brownish. *Scape* whitish buff, brindled above with a few dark fuscous scales. *Antennae* whitish with two broad brownish fuscous rings on each joint, giving a bronzy sheen. *Thorax* and *Tegulae* buff, lightly brindled brown. *Abdomen* above, brownish fuscous mixed fuscous, laterally and posteriorly on each segment, narrowly pale buff, anal tuft buff mixed fuscous; below pale buff with lateral black spots. *Legs* pale buff, fore-legs heavily brindled darkish fuscous above, tarsi ringed dark fuscous; middle pair less heavily brindled, hind pair only lightly brindled brownish on tibiae and tarsi. *Forewings* pale buff brindled brownish, more

densely across middle of disc and along dorsum; a short vertical line of dark fuscous scales from dorsum to middle near base, and a small blackish fuscous dot on middle of disc near  $\frac{1}{2}$  and a fainter one beyond  $\frac{1}{2}$ , a brownish patch above; costa and dorsum lightly brindled dark fuscous, in basal half this brindling becoming more general, and less distinct in outer half; cilia pale buff, a fine brownish fuscous line through middle from apex to anal angle. *Hindwings* light fuscous darkening from base and margin lined purplish fuscous from anal angle to apex, nervures slightly darker than ground; cilia basally brownish buff apically whitish buff from apex half way to anal angle, thereafter cilia fuscous excepting for brownish base.

*Larva* light yellowish green, dorsal line green fading towards rear, head and plates black, warts reddish grey, in mined and rolled leaves of *Carlina*. Lhomme states that the larva pupates on the plant. IV-VI.

*Imago* locally through England, VII-VIII; abroad in Central Europe, France, Italy, Sardinia and Dalmatia.

11. *Depressaria carduella* Hb. *Exp.* 16 mm. *Head*: face whitish buff, crown rough scaled with orange scales tipped pale buff. *Palpi* apical joint orange buff, a dark fuscous band at base and another at about  $\frac{2}{3}$ , both darker below; middle joint pale buff shading to pale orange buff below, lightly brindled fuscous on outer side. *Scape* buff, brindled fuscous. *Antennae* greyish, ringed fuscous. *Thorax* and *Tegulae* light brownish buff brindled fuscous and paler buff. *Abdomen* whitish buff becoming more yellowish buff posteriorly, brindled dorsally fuscous excepting posterior margin of each segment, anal tuft yellowish buff; under side buff, lightly brindled fuscous more heavily brindled along sides. *Legs*: forelegs pale buff heavily brindled fuscous below, tibiae orange above lightly brindled dark fuscous, tarsi buff brindled orange and dark fuscous, final two joints blackish fuscous; middle pair as forelegs but less darkly brindled; hindlegs buff lightly brindled fuscous, long spurs buff, short spurs basally fuscous apical third buff. *Forewings* bright orange brown obscurely brindled light fuscous, two small blackish dots at about  $\frac{1}{3}$ , the inner being above, and the other on the central line, another such dot on centre line just beyond  $\frac{1}{2}$ , a fuscous suffusion from centre line between the dots to costa, lightening sub-costally but darkening again on costa; two further black dots half way to costa at about  $\frac{2}{3}$  and odd blackish scales widely sprinkled over wings; cilia light orange brown heavily brindled fuscous excepting for a narrow central orange line. *Hindwings* whitish fuscous darkening very slightly towards apex, veins slightly darker, cilia whitish buff with light fuscous sub-basal and apical lines, fading towards anal angle and expanding to cover whole of cilia above apex.

*Larva* pale grey-green with pinkish tinge, dorsal and sub-dorsal lines slightly darker, head, plates and warts black. In mine along midrib of *Cirsium*, *Carduus* and *Arcticum*. Lhomme also mentions *Centaurea nigra*. V-VII.

*Imago* locally throughout England. VII-VIII; abroad in France, Central Europe and South Russia.

12. *Depressaria zephyrella* Hb. *Exp.* 16 mm. *Head*: face whitish buff darkening sharply to brownish buff at top, crown pale and brownish buff mixed, rough scaled. *Palpi* apical joint buff ringed fuscous at base and at  $\frac{3}{4}$ , finely tipped fuscous, and a line of fuscous scales on inner side connecting the two bands; middle joint pale buff, lightly brindled brownish fuscous on outer side. *Scape* brownish fuscous. *Antennae* greyish buff narrowly ringed fuscous, one band on each joint of basal half, two bands on each joint of outer half. *Thorax* buff, lightly brindled brownish fuscous. *Tegulae* buff brindled brownish fuscous on outer half. *Abdomen* creamy buff, lightly brown on posterior edge of segments mixed buff and pale buff, ventral surface buff with fairly large dark fuscous lateral spots on each segment. *Legs*: forelegs buff brindled light fuscous, tarsi ringed basally fuscous; middle pair buff lightly brindled fuscous, tibiae fuscous above, tarsi basally ringed brownish fuscous; hind pair light buff, very lightly brindled brownish, spurs buff. *Forewings*: extreme base on dorsal half clear buff, on remainder of wing the buff ground colour is more or less brindled light brownish fuscous, the clear basal area edged distally sooty fuscous, two blackish dots at about  $\frac{1}{3}$ , the first above and second on centre line, a round sooty fuscous spot on centre line at about  $\frac{1}{2}$ , nervure ends on termen dotted sooty fuscous; cilia light fuscous on apical half, pale buff towards anal angle. *Hindwings* creamy white becoming very pale fuscous towards apex, nervures slightly darker, no dark margin; cilia pale buff at apex shading to whitish buff at anal angle, an obscure fine light fuscous sub-basal band.

*Larva* green with yellowish head and plates, dorsal and sub-dorsal lines darker green; in rolled leaves of *Anthriscus cerefolium*, *Chaerophyllum*, etc. VI-VII.

*Imago* locally in England VIII-IV; abroad in France, Germany, Holland and Asia Minor, probably also across South and Central Europe.

13. *Depressaria putridella* Schiff. *Exp.* 15 mm. *Head*: face whitish with few brown scales, more buff towards sides, crown scales buff and light fuscous tipped whitish buff. *Palpi*: apical joint inwardly pale pinkish buff, outwardly brindled fuscous, middle joint pale buff brindled fuscous at lower end of inner side and all over outer side. *Scape* greyish fuscous, *Antennae* greyish fuscous lightly banded fuscous. *Thorax* buff with fuscous centre line, posteriorly suffused orange laterally, *Tegulae* buff lightly brindled brownish and light fuscous, *Abdomen* buff dorsally brindled very light fuscous, laterally fuscous ventrally buff brindled fuscous, anal tuft fuscous buff. *Legs*: forelegs fuscous, tarsi banded drab fuscous; middle pair femora basal half fuscous, distal half light fuscous, tibiae light fuscous, tarsi buff banded fuscous, hind legs buff banded light fuscous. *Forewings* buff with nervures picked out in fuscous, two black dots, the lower and outer one on centre line at about  $\frac{1}{3}$ , a whitish dot ringed dark fuscous on centre line slightly beyond  $\frac{1}{2}$ , nervure ends strongly dotted dark fuscous on

apical region and on termen; cilia light fuscous tipped pale buff, a small patch at apex entirely light fuscous. *Hindwings* buff becoming slightly fuscous apically, nervures fairly distinctly lined brownish fuscous, cilia buff at apex lightening towards anal angle, an indistinct fuscous buff sub-basal line.

*Larva* dull green, head golden brown, plates more greenish, warts small and backish in light rings, on *Peucedanum officinale*, showing a preference for the young leaves when feeding, and going to the upper part of the plant to pupate; the threadlike leaves are spun together into a tube. The larva is apparently subject to heavy parasitisation. V-VI.

*Imago* locally in Kent and Essex, VII-VIII. Abroad in France, South Germany, Northern Austria and Hungary.

14. *Depressaria cnicella* Treits. *Exp.* 19 mm. *Head*: face whitish fuscous, laterally light chocolate, crown purple brown whitish tipped scales. *Palpi* apical joint pinkish buff widely banded at base and at  $\frac{2}{3}$  dark fuscous; middle joint inwardly pale buff, outwardly heavily brindled purple brown and dark fuscous with a few buff scales. *Scape* greyish fuscous, distally whitish buff; *Antennae* darkish grey banded dark fuscous, the whole with a pinkish brown sheen. *Thorax* purplish brown, a posterior crest of purple brown whitish tipped scales, posterior end of thorax fuscous brown tipped scales; *Tegulae* purple brown suffused whitish at sides and posteriorly. *Abdomen* brownish fuscous laterally whitish above; ventrally dark blackish fuscous lateral lines and two somewhat obscure similarly coloured lines close together in central area. *Legs*: forelegs greyish buff brindled brownish fuscous, tarsi dark greyish fuscous banded buff; middle pair purplish fuscous, tarsi dark greyish fuscous lightly banded buff; hind pair buff laterally brindled brownish fuscous, spurs light greyish fuscous, tarsi buff brindled brownish fuscous. *Forewings* rusty brown slightly brindled fuscous, basal area heavily brindled creamy white, and more sparsely similarly brindled along costa to about  $\frac{3}{4}$ , three small whitish dots on centre line of disc, one at about  $\frac{1}{3}$ , one at  $\frac{1}{2}$  and one just past  $\frac{1}{2}$ ; terminal nervures lined darker brown; cilia fuscous brindled reddish brown. *Hindwings* light fuscous buff slightly darkening towards apex, nervures lined pale dull brownish fuscous; cilia light fuscous buff, basally light brownish fuscous excepting at anal angle, two indistinct lines near outer ends of cilia.

*Larva* olive green, darker dorsally, head and plates black edged dull brown, warts small and black. On *Eryngium maritimum* and *E. campestre*, between spun leaves and gregariously in spun tips, V.

*Imago* on south coast from Hampshire and on east coast to Suffolk, VI-VII. Abroad: North West Russia, central and south Europe including France, Spain, Sicily and Asia Minor.

15. *Depressaria hepatariella* Zell. *Exp.* 22 mm. *Head*: face dull brown, shading downwards to pinkish brown, crown rough scaled dull brown. *Palpi* apical joint rather shorter than usual for *Depressaria*,



dull brownish buff brindled brownish fuscous; middle joint rather longer than usual, whitish buff inwardly, outwardly sooty fuscous brindled brown. *Scape* purplish fuscous, lighter apically. *Antennae* dull brownish fuscous with short cilia giving a glossy appearance. *Thorax* rusty brown frontally, posteriorly dark purplish brown, a post-median crest of rusty whitish-tipped scales; *Tegulae* rusty brown the posterior scales being tipped whitish. *Abdomen* dull light fuscous banded whitish fuscous at posterior edges of segments, anal tuft brown and buff mixed; basally cinnamon brown; under surface pinkish fuscous slightly darker brindled laterally. *Legs*: forelegs dark purplish fuscous, tarsi brindled buff; middle pair as forelegs but slightly lighter; hindlegs buff above brindled brown and fuscous below, long spurs fuscous, short spurs dark fuscous. *Forewings* lightish rusty brown, darker towards base, pinkish buff at base excepting costa, costa brindled alternately sooty fuscous and whitish buff, tornus lightly brindled sooty fuscous and whitish buff; a white discal dot beyond  $\frac{1}{2}$  on centre line; cilia brownish scales edged whitish buff, basally a narrow rusty line. *Hindwings* light dusky fuscous slightly darker apically and on nervures; cilia light brownish fuscous tipped whitish.

*Larva* so far apparently unknown.

*Imago* Inverness VIII; abroad a mountain species in Switzerland, the Carpathian Alps, West Russia, and Lapland; one record from Holland.

16. *Depressaria astrantiae* Hine. *Exp.* 20 mm. *Head*: face pale buff, crown rough scaled pale brownish buff; *Palpi* apical joint light buff, a very few dark brown scales at base and near apex; middle joint inwardly light buff, outwardly light buff brindled dark fuscous in dorsal half and pinkish brown in lower half. *Scape* brindled buff, nut-brown and greyish; *Antennae* pale grey banded pinkish fuscous in middle and dark sooty fuscous at distal end of each joint, the banding only on upper, frontal and posterior surfaces, pale buffish grey below. *Thorax* light nut-brown mixed brownish buff, posterior point dark sooty fuscous, *Tegulae* nut-brown anteriorly shading off to brownish buff posteriorly. *Abdomen* pale fuscous becoming buff at sides and at posterior edges of segments; below lightly brindled with dark sooty fuscous, segments 3 and 4 with strong lateral and weak ventral spots of dark sooty fuscous, anal tuft pale buff. *Legs*: forelegs buff strongly brindled dark sooty fuscous and pinkish brown, tarsi marked pinkish brown at extremity of two basal joints and white at terminal; middle pair as forelegs but lighter, tarsi apically banded on all joints; hind legs buff lightly brindled fuscous on femora and tibiae, tarsi banded buff at outer ends of first three joints, extreme two joints all buff. *Forewings* basal area pale buff with extreme base of costa dark tan, wing otherwise light tan mixed with buff at tornus, costa pinkish brown weakly maculated sooty fuscous, dark tan on outer margin of basal patch, two dots, dark fuscous mixed tan at about  $\frac{1}{3}$  on centre line, the inner being slightly higher, a white dot at beyond  $\frac{1}{2}$ , an obscure dark fuscous spot in end of cell and a similar from whitish dot to extremity of 1c, termen lined sooty

fuscous between nervures, pinkish brown at ends of nervures; cilia strongly pinkish brown at apex paling to buffish fuscous at anal angle, the whole with fuscous bands on inner and outer edges. *Hindwings* pale straw shaded pale sooty fuscous darkening outwardly to light sooty fuscous nervures lined slightly darker than ground, cilia pale buff becoming whitish at anal angle.

*Larva* is described by Meess (in Spuler) as dirty green with fine black dots, head and plates black, the plates finely divided by white line, V-VI. on spun lower leaves of *Astrantia major* and *Sanicula europaea*, and T. Bainbrigge Fletcher remarks that the latter plant is probably its foodplant here.

*Imago* first discovered in the Stroud district of Gloucestershire by T. Bainbrigge Fletcher (*Ent. Rec.* XLVII, pp. 57-58, 15.v.1935), and odd specimens have since been recorded from the southern half of England principally in M.V. light traps; VII-IV. Abroad in Denmark, France, Germany, Austria.

17. *Depressaria angelicella* Hb. *Exp.* 18/19 mm. *Head*: face, light brownish buff, chestnut before eyes, crown scales yellowish buff at base, light fuscous in middle and whitish buff at tips. *Palpi* apical joint inwardly light buff, outwardly brownish buff heavily banded at base and about  $\frac{1}{2}$ , dark sooty fuscous, finely tipped blackish fuscous; middle joint pale buff, outwardly heavily brindled dark brownish fuscous, inwardly plain. *Scape* brownish fuscous, apically creamy buff; *Antennae* greyish narrowly banded fuscous, the whole with a slight pinkish sheen. *Thorax* dark chestnut lightening posteriorly, *Tegulae* dark chestnut lightening to whitish buff posteriorly. *Abdomen* light brownish fuscous, brindled fuscous above, yellowish buff below heavily marked dark sooty brown laterally. *Legs*: forelegs buff, femora heavily brindled sooty fuscous, tibiae rose pink above, laterally edged dark fuscous, tarsi heavily banded dark sooty fuscous; middle pair buff brindled dark fuscous excepting at joints; hindlegs buff lightly brindled fuscous, long spurs light fuscous, short spurs dark fuscous, light at tips, tarsi brindled brownish excepting at joints. *Forewings* buff suffused pinkish brown darkening to chestnut before light base, costa dotted dark fuscous and buff alternately, lightening apically to the pinkish brown and buff; a white dot at  $\frac{1}{2}$  preceded by two white dashes along centre line which are preceded by a small white dot slightly above centre line, all more or less surrounded by dark fuscous scales, nervure terminations marked obscurely fuscous on termen, cilia light buff obscurely barred with two rings of pale pinkish brown; the species varies from pinkish buff to almost sooty ground. *Hindwings* pale shining buff, nervures lightly marked fuscous in outer half; cilia pale buff with obscure pale fuscous inner and outer lines darkest at apex and disappearing before anal angle.

*Larva* dull green, head and plates reddish straw, warts black; lives gregariously in spun and contorted leaves of *Angelica sylvestris*, V-VI. Spuler also mentions *Eupatorium cannabinum* and *Heracleum*.



*Imago* locally in England, Scotland to Argyll, and Northern Ireland, VII-IX. Abroad in Scandinavia, Finland, Belgium, rarely in France, Germany and Central Europe.

18. *Depressaria rotundella* Dgl. *Exp.* 14 mm. *Head*: face whitish buff mixed sooty black, crown yellowish buff. *Palpi* apical joint light buff outwardly brindled brownish, middle joint inwardly whitish buff, outwardly brownish buff with odd sooty scales. *Scape* darkish fuscous apically banded whitish buff, antennae whitish buff, narrowly banded fuscous at outer end of each joint, the whole with a greyish sheen. *Thorax* brownish fuscous shading off to whitish buff posteriorly. *Tegulae* buff. *Abdomen* above laterally buff dorsally greyish fuscous, below whitish buff with rings 3 and 4 more or less purple brown and 5 to 7 with lateral sooty spots. *Legs*: forelegs buff, femora and tibiae sooty fuscous above, tarsi brindled basally sooty fuscous; middle pair light fuscous brindled darker, hind pair light buff, long spurs light fuscous buff, short spurs greyish fuscous tipped whitish buff. *Forewings* pale ochreous buff, a small brownish fuscous dot near base of dorsum, a sooty dot above centre line at slightly after  $\frac{1}{4}$ , another such dot on centre line at about  $\frac{1}{2}$ , nervure ends obscurely dotted fuscous on termen, a few single brownish scales scattered evenly about disc, cilia whitish buff. *Hindwings* very pale brownish fuscous darkening towards margins, with slight purplish sheen, cilia whitish buff basally pale brownish fuscous from beyond anal angle to apex.

*Larva*: Meyrick describes the larva as green, dorsal and sub-dorsal lines darker, head and plates of 2 black, on *Daucus carota* VI-VIII.

*Imago* round South Coast from Kent, Eastern Ireland and Meyrick also mentions Cheshire, IX-IV. Abroad locally in France and Belgium, South Germany, and South Europe to Asia Minor.

19. *Depressaria capreolella* Zell. *Exp.* 14 mm. *Head*: face whitish slightly brownish towards crown which is light fuscous brown. *Palpi* apical joint whitish buff slightly brindled buff, basally fuscous below and a fuscous dot at  $\frac{2}{3}$  on inner side, finely tipped blackish fuscous; middle joint whitish buff, inwardly plain, outwardly brindled brownish. *Scape* whitish, brindled fuscous basally; *Antennae* light grey banded fuscous at outer end of each joint. *Thorax* light brownish buff brindled light brown anteriorly, posteriorly dull sooty fuscous; *Tegulae* shading from light brown anteriorly to pale brownish buff posteriorly. *Abdomen* dorsally whitish buff brindled light purplish fuscous, ventrally light brownish buff brindled light brown, lateral dots dark fuscous, two ventral dots on each segment somewhat obscure brownish fuscous, anal tuft light brownish fuscous. *Legs*: forelegs whitish fuscous outwardly brindled fuscous, tarsi pale whitish fuscous banded brownish fuscous; middle pair as forelegs; hindlegs similar but paler, spurs light shining fuscous. *Forewings* basally and along costa to nearly  $\frac{1}{2}$  light brownish buff, disc light brownish straw, costa to  $\frac{1}{2}$  brindled with patches of sooty fuscous, the light basal patch outwardly bordered by a few darkish fuscous scales; on centre line of disc two dark brownish fuscous dots

at  $\frac{1}{3}$ , the upper being nearer to the base; a few white scales on the outer side of the lower dot, and is followed at about  $\frac{1}{2}$  and just beyond  $\frac{1}{2}$  by two whitish dots around which is an area of dusky fuscous scales; nervures obscurely dotted fuscous at termen; cilia light fuscous. *Hindwings* light fuscous darkening apically, with a pinkish sheen; margin almost from apex to anal angle finely lined fuscous, cilia light fuscous with an obscure darker sub-basal line to anal angle, where cilia become whitish buff.

*Larva* green with darker dorsal and sub-dorsal lines, head, plates and warts black, on basal leaves of *Pimpinella*; Lhomme also gives *Daucus carota*, *Falcaria rivini*, and *Sium latifolium* to which Spuler adds *Sium falcaria*; spinning leaves into tube; VI-VII.

*Imago* VIII-IV, locally throughout England and in East and North Ireland. Abroad in Sweden, Finland, France, and through Central and South Europe to Asia Minor.

20. *Depressaria ciliella* Stt. *Exp.* 23 mm. *Head*: face brownish white, dark chestnut round base of scape, crown rough scaled with scales cinnamon brown at base apically whitish buff. *Palpi* apical joint with basal  $\frac{1}{4}$  light fuscous brindled brown, second  $\frac{1}{4}$  light buff, third  $\frac{1}{4}$  sooty black, apical  $\frac{1}{4}$  pink finely tipped blackish. *Scape* dark chestnut, apically light buff; *Antennae* light greyish fuscous banded darkish fuscous at joints. *Thorax* anteriorly blackish brown shading through chestnut to brownish white posteriorly; *Tegulae* similar but less blackish brown. *Abdomen* pale buff more or less brindled brownish and fuscous dorsally, ventrally brownish buff, segments with heavy sooty fuscous lateral dots, anal tuft yellowish buff. *Legs*: forelegs with femur buff heavily brindled sooty fuscous apically buff below, tibia similar but pink above, tarsus dark sooty fuscous ringed buff excepting on joints 3 and 4; middle pair buff lightly brindled fuscous, tarsus more or less dark ringed at joints; hindlegs buff lightly brindled sooty fuscous, spurs heavily brindled dark fuscous excepting at apex. *Forewings* basally marked pinkish buff, disc light pinkish chestnut, a white dot slightly above centre of disc at  $\frac{1}{3}$  dark edged above, another dark edged white dot beyond  $\frac{1}{2}$  on centre line, between them on centre line, two white dashes, the inner one strongly dark at ends, the other lightly ringed with darkish scales, tornus lightly brindled buff and dark fuscous, nervures rather obscurely dotted sooty on termen, costa with a rather heavy dark dot at  $\frac{1}{4}$  and more obscurely marked with lighter fuscous strigulae, outer half mixed pinkish buff, cilia pinkish buff suffused fuscous, a light fuscous line near base. *Hindwings* shining creamy whitish slightly marked light fuscous at extreme apex, cilia light buff at anal angle, gradually darkening to light fuscous at apex, obscurely darker at base, and two obscure fuscous lines near outer edge.

*Larva* dull green, dorsal and lateral lines more or less darker, head and plates brownish, the latter with two black dots, warts small and blackish, similar to *D. applana* but distinguished by brownish head and

plates; feeds gregariously in spun shoot of *Angelica*, also in *Daucus*, *Selinum*, etc., VI-VII.

*Imago* VIII-IV, common throughout England and Ireland. Abroad in Scandinavia, France and Central Europe to Bohemia and the Tyrol.

21. *Depressaria applana* Fab. *Exp.* 21 mm. *Head*: face pale buff, brownish fuscous at sides and above, crown rough scaled pale buff mixed dark brownish fuscous at sides. *Palpi* apical joint outwardly brownish fuscous, inwardly pale buff, ringed sooty black in basal  $\frac{1}{4}$  and also in third  $\frac{1}{4}$ , finely tipped black; middle joint pale buff outwardly brindled brownish fuscous. *Scape* dark fuscous distally ringed buff, *Antennae* pale greyish buff, narrowly ringed dark fuscous at base of each joint. *Thorax* dark fuscous brown anteriorly and posteriorly laterally brindled pale buff, pale brownish crest; *Tegulae* brownish fuscous. *Abdomen* above, buff lightly brindled fuscous, last two segments darker; below, buff with two strong rows of blackish lateral dots and two weak rows of ventral dots at lower edge of each ring. *Legs*: forelegs buff brindled dark fuscous, tarsi with joints broadly ringed dark fuscous; middle pair as forelegs but tibiae with a tuft of brown scales on upper side of second quarter; hindlegs as forelegs but tibiae pinkish buff on outer side, buff above. *Forewings* fuscous buff, brindled brownish fuscous and sooty fuscous, lower half of base brownish buff followed by a sooty fuscous limiting line, costa buff maculated sooty fuscous and fuscous brown, two white dots on central line of disc at  $\frac{1}{2}$  and slightly past  $\frac{1}{2}$ , the first heavily marked below with a short horizontal black dash and inwardly above with a similar oblique dash, disc brindled brownish fuscous to outer  $\frac{1}{3}$  which is dull buff to tornus where there are a few brownish fuscous scales, nervures obscurely dotted sooty fuscous on termen, cilia light brownish buff basally brownish fuscous. *Hindwings* light shining straw, nervures obscurely lined pale fuscous, margin lined fuscous between nervures, these dashes being paler towards anal angle, cilia dark brownish fuscous apical half, light fuscous to anal angle, the whole with a fairly strong brownish fuscous basal line.

*Larva* green, dorsal and sub-dorsal lines darker, more yellowish below sub-dorsals; warts and plates greyish black; V-VII in spun leaf tubes on *Anthriscus* and *Heracleum*, and Meyrick adds *Angelica*; Lhomme adds many other Umbellifers.

*Imago* VIII-IV, abundant everywhere in England, Ireland and South Scotland; abroad in North and Central Europe, France, Italy, Madeira, and Meyrick adds South Africa (probably introduced).

22. *Depressaria purpurea* Haw. *Exp.* 15 mm. *Head*: face whitish buff, crown rough scaled with dull purplish brown whitish tipped scales. *Palpi* apical joint light straw with pinkish tinge banded sooty fuscous at base and above  $\frac{1}{2}$ , tipped black; middle joint inwardly pale buff, outwardly brindled brownish fuscous, pinkish brown below. *Scape* brownish fuscous, distally whitish buff; *Antennae* pinkish grey narrowly banded fuscous at base of joints. *Thorax* anteriorly pinkish

brown, mesally dull brownish fuscous, posteriorly crested dark purplish fuscous; *Tegulae* pinkish brown anteriorly mesally dull brownish fuscous posteriorly whitish, all scales whitish tipped on thorax and tegulae. *Abdomen* light fuscous with pinkish sheen above, light straw below, only very obscurely marked blackish at sides. *Legs*: forelegs pale whitish straw brindled dark fuscous, tibiae pinkish brown above, tarsal joints widely dark fuscous, narrowly banded whitish straw distally; middle pair as forelegs but a pinkish brown spot at distal end of femur and two such bands, one at  $\frac{1}{2}$  and the other at distal end of tibia; hindlegs pale whitish straw lightly brindled fuscous, tibiae with salmon pink scales above amongst light straw bristles, long spurs light straw, short spurs fuscous. *Forewings* costal third from base to above 7 whitish straw brindled pinkish, brown and greyish fuscous, lower base whitish straw slightly brindled greyish fuscous, remainder of disc basally dull brown lightening to pinkish brown at termen, all scales pink tipped giving the whole a purplish aspect; a white dash on centre line from  $\frac{1}{3}$  bounded by black V at inner end, a small black ringed white dot at  $\frac{1}{2}$  and a slightly larger white dot beyond  $\frac{1}{2}$ , cilia pinkish brown slightly darker than termen, and whitish straw outwardly. *Hindwings* light straw lightly brindled, and nervures lightly lined pale purplish fuscous, cilia dull brownish at apex lightening to whitish fuscous at anal angle, the whole narrowly whitish straw outwardly.

*Larva* yellow with black head and thorax, anal plate with two raised scales; VI-VIII on *Chaerophyllum*, *Daucus* and *Torilis* in leaves spun into tubes.

*Imago* VIII-IV locally in England to Lincolnshire, Eastern and Southern Ireland; abroad throughout France and Belgium, North and South Europe to North Asia Minor and Turkestan.

23. *Depressaria alstroemeriana* Clerck. *Exp.* 20 mm. *Head*: face shining white, crown rough-scaled whitish straw. *Palpi* apical joint white, lightly banded brown at base and in middle, and finely tipped blackish; middle joint white, outwardly lightly brindled brownish fuscous. *Scape* light fuscous dorsally blackish, tipped white; *Antennae* brownish grey finely brindled darkish fuscous, giving a shining grey appearance. *Thorax* white, anteriorly slightly brown, posterior brownish crest, *Tegulae* white, finely brindled yellowish brown. *Abdomen* whitish above, whitish buff below with four sooty blackish dots on each segment ventral pair small, lateral pair fairly strong; anal tuft whitish. *Legs*: forelegs with whitish femora heavily brindled dark brownish fuscous, tibiae similarly brindled on upper surface, tarsi first three joints basally banded dark fuscous, final two blackish fuscous; middle pair femora and tibiae whitish, lightly brindled dark fuscous, tarsi rather more heavily brindled, joints distally banded white; hindlegs light buff, long spurs pale buff, short spurs basally blackish fuscous apically buff, tarsi fairly light sooty fuscous distally banded whitish. *Forewings* white with three blackish spots on basal half of costa followed by a blackish blotch above outer end of cell at  $\frac{1}{2}$ , a light brown suffusion below the costal spots and before the blotch, a rusty dash in upper part

of cell below the costal spots and before the blotch; lower half of disc brownish fuscous after white base, shading off to white at  $\frac{2}{3}$ , tornus suffused light brownish fuscous, veins 2 and 3 lightly, and 4, 5, and 6 heavily dotted blackish on termen; three or four short brownish fuscous lines from dorsum in basal half and two obscure lines of sooty fuscous dots on nervures, one at about  $\frac{3}{4}$  and the other about half way to termen; cilia whitish tipped pale fuscous, brownish at anal angle. *Hindwings* light fuscous darkening towards apex, nervures faintly lined fuscous and apex lined darkish fuscous from 3 upwards, cilia whitish basally light fuscous also tipped light fuscous at anal angle.

*Larva* dull green with darker dorsal and sub-dorsal lines, head and plates greenish, warts blackish, VI-VII in rolled leaves of *Conium maculatum*.

*Imago* VIII-IV in Britain to central Scotland, and Ireland, abroad in North and Central Europe, France excluding the south-east, Spain, and across to South West Russia and Eastern Siberia.

24. *Depressaria ocellana* Fab. *Exp.* 23 mm. *Head*: face whitish buff mixed dark brown at sides, crown rough scaled greyish buff shaded brownish. *Palpi* apical joint light buff lightly brindled blackish at base, strongly banded blackish from  $\frac{1}{2}$  to  $\frac{3}{4}$  and tipped black; middle joint inwardly pale buff, outwardly lightly brindled blackish brown. *Scape* whitish buff below, greyish buff above, heavily brindled brown and dark fuscous; *Antennae* whitish grey banded fuscous at base of joints, the whole with a purplish sheen. *Thorax* whitish buff, anteriorly sprinkled brownish, a distinct blackish brown dot on each side of anterior half, double posterior crest, posterior point of thorax dark purplish fuscous; *Tegulae* whitish buff, darker anteriorly; *Abdomen* above, whitish buff sparsely brindled pale fuscous, below pale buff strongly spotted laterally on each segment with dark blackish fuscous, anal tuft pale buff. *Legs*: forelegs, femora and tibiae light buff heavily brindled dark fuscous, tarsi light buff ringed dark fuscous; middle pair light buff brindled brownish, tarsi as forelegs; hindlegs, femora darkly brindled dark fuscous, tibiae buff, long spurs buff, short spurs blackish based and buff tipped, tarsi as forelegs but with pinkish sheen on basal joint. *Forewings* pale buff, costa lightly maculated blackish, a red-edged black dash on central line of disc at  $\frac{1}{3}$  preceded by a similarly coloured dot higher; a red dash continuing from the black dash, enveloping a white dot just beyond  $\frac{1}{2}$ , over the red dash is a black triangle in the outer part of cell; basal whitish area separated by a fine dark sepia vertical line, sharply shading off to ground colour distally; a red dot on 1 immediately below the black dash; nervures obscurely picked out by occasional dark fuscous scales, a pinkish suffusion at tornus, nervure ends strongly dotted blackish on termen; cilia greyish and fuscous mixed, outwardly pinkish from apex down fading towards anal angle. *Hindwings* shining pale buff, nervures picked out in pale pur-

plish fuscous and apical part of wing similarly suffused; cilia pale whitish buff, outwardly very pale fuscous lightening at anal angle.

*Larva* pale dull green, yellowish at segments, head black, plates yellow marked black, VI-VII in spun leaves and young twigs of *Salix*; Lhomme adds young shoots of *Betula* and *Quercus*.

*Imago*: VIII-IV in England and Ireland; abroad across Europe excepting arctic regions and Spain; across Russia to Eastern Siberia; North Africa.

25. *Depressaria yeatiana* Fab. *Exp.* 20 mm. *Head*: face whitish buff, crown rough scaled buff mixed brown at front. *Palpi* apical joint pale buff banded sooty fuscous at base and middle, darker inwardly, finely tipped black. *Scape* pale buff below, greyish fuscous above; *Antennae* pale greyish buff banded fuscous at distal ends of joints. *Thorax* buff, anteriorly slightly darker, posteriorly whitish; *Tegulae* similar. *Abdomen* light buff above and below, segments with four sooty fuscous spots below, the outer large and heavy, the inner obscure; segments 1 and 2 suffused brownish laterally. *Legs*: forelegs greyish fuscous, tarsi banded whitish on joints 1, 2 and 5; middle pair with femora and tibiae buff brindled brown, tibiae brown in upper half, tarsi lightly brindled brown; hindlegs buff, long spurs buff, short spurs fuscous based, buff tipped. *Forewings* straw, nervures picked out fuscous with a few blackish fuscous scales: light basal area bounded distally by a dark fuscous vertical line to central line of disc, shading off distally quickly through brown to pale pinkish fuscous; a blackish dot on central line at  $\frac{1}{3}$  preceded by a similar dot slightly higher, a fuscous ringed white dot at slightly past  $\frac{1}{2}$ , a small sooty area at upper corner of cell, ends of nervures marked blackish fuscous on termen, strongly below apex and more obscurely towards anal angle; cilia pinkish straw, white outwardly at anal angle. *Hindwings* whitish straw basally, becoming pale fuscous in outer half, margin lined light fuscous between apical nervures, nervures obscurely lined pale fuscous, cilia whitish straw.

*Larva*: Meyrick describes the larva as yellowish green, head black, in spun shoots of *Daucus carota*, VI-VII. Lhomme adds *Carum* and *Oenanthe pimpinelloides*, mentioning the umbels of *D. carota*, and the extremities of leaves of the other plants rolled into tubes.

*Imago*: IX-IV in England and Ireland; abroad throughout France, Central and South Europe, Corsica and North Africa.

26. *Depressaria ciniflonella* Zell. *Exp.* 20 mm. *Head*: face mixed fuscous, rusty brown and whitish, crown rough scaled whitish mixed pale fuscous. *Palpi* apical joint whitish, heavily brindled dark fuscous, lighter at middle and whitish buff at tip; middle joint whitish, heavily brindled brownish fuscous. *Scape* fuscous mixed blackish, a few white scales distally; *Antennae* pale greyish fuscous lightly banded at apex and darkly at base of each joint. *Thorax* whitish mixed dull brown



slightly chestnut anteriorly, rather dark dull brown posteriorly, the scales being striated and tipped white; *Tegulae* light brown and fuscous mixed white. *Abdomen* lightish fuscous, lighter at posterior edge of each segment, ventral surface as upper, anal tuft buff basally mixed fuscous and tipped whitish. *Legs*: forelegs rather dark fuscous lightly brindled whitish, middle pair as forelegs, hindlegs light buff brindled light brownish fuscous, last three joints of tarsi darkish fuscous distally banded whitish, tibiae dorsally covered with long light buff hairs, long spurs brindled as tibiae, short spurs blackish fuscous at base, whitish buff at tip. *Forewings* whitish, maculated darkish fuscous along costa and lighter fuscous in basal light patch; a sooty dot on centre line at  $\frac{1}{2}$  preceded by a similar dot slightly higher; these two dots are followed by an almost circular whitish one brindled very pale fuscous and one or two sooty scales, bounded distally by a sooty and fuscous patch in outer end of cell based on a sooty dash on centre line; this ends in a ring round a white dot slightly beyond  $\frac{1}{2}$ ; dorsal area rather thickly brindled light fuscous, nervure 1 lined darkish fuscous to  $\frac{1}{2}$  edged rusty fuscous; outer area more lightly brindled light fuscous with rusty patches and a few scattered sooty scales; margin lined sooty between nervures from apex to 2; cilia light fuscous tipped whitish. *Hindwings* pale straw becoming tinged pale fuscous towards apex, cilia pale straw obscurely banded pale fuscous.

*Larva* purple brown, head pale reddish, plates blackish and warts black, IV-V in spun birch leaves.

*Imago*: VI-III, Perth and Inverness abroad in Scandinavia, North Germany, West Russia, Carinthian Alps, and Canada.

27. *Depressaria hypericella* Hb. *Exp.* 20 mm. *Head*: face light buff, crown rough scaled yellowish buff brown round scape. *Palpi* apical joint whitish buff lightly brindled brown outwardly, apical  $\frac{1}{2}$  black; middle joint light buff inwardly, outwardly blackish at base shading off through sooty brown to pinkish fuscous. *Scape* blackish; *Antennae* greyish banded black at basal and dark fuscous at outer end of each joint. *Thorax* yellowish buff, a few brown scales in crest, posteriorly brown edged blackish brown; *Tegulae* pinkish brown distally mixed sooty fuscous and white. *Abdomen* dull fuscous mixed buff laterally, under-side buff to 4, elsewhere heavily brindled purplish fuscous and blackish, anal tuft light fuscous. *Legs*: forelegs femora buff heavily brindled blackish, tibiae pinkish brown with three sooty fuscous spots above, tarsi blackish fuscous distally ringed buff on outer end of basal and two extreme joints; middle pair as forelegs but tibiae dark fuscous tinged pinkish brown; hindlegs as forelegs but tibiae buff brindled dark fuscous, spurs all dark fuscous tipped buff. *Forewings* pinkish brown basal area marked by narrow buff line from costa to cell then bent at a right angle towards base of dorsum, the enclosed area dark sooty fuscous at costa, centrally fuscous mixed pinkish brown, black below, and whitish buff on inner end of dorsum; costa sooty black striated with short fine

buff lines more heavily lined buff at  $\frac{1}{2}$  and  $\frac{3}{4}$ ; a sooty dot at  $\frac{1}{2}$  on centre line preceded by a lighter one joining it into an L-shaped mark, a buff spot on centre line beyond  $\frac{1}{2}$  surrounded by bright rusty crimson, nervures picked out sooty fuscous, base of cell suffused lightish sooty fuscous to pinkish brown, the whole lightly brindled buff; termen dotted blackish; cilia pinkish fuscous banded in middle and outwardly fuscous. *Hindwings* shiny straw suffused fuscous darkening outwardly; nervures lightly fuscous, cilia pale fuscous becoming yellowish at anal angle.

*Larva* dull bluish green, head and plates yellow green, warts black, V-VI in spun shoots of *Hypericum perforatum*, *H. hirsutum* and *H. quadrangulum*.

*Imago* VII, throughout England; abroad in Europe from Sweden to Spain and France to Western Russia.

28. *Depressaria conterminella* Zell. *Exp.* 19 mm. *Head*: face dull purplish fuscous laterally, dirty buff centrally; crown rough scaled, brown at sides and round scape, whitish buff anteriorly. *Palpi* apical joint sooty blackish, finely tipped buff, and buff at base excepting the front which is brindled with purplish brown; middle joint inwardly buff, lower edge and distal end dark purplish brown, outwardly brindled sooty blackish, reddish brown and buff. *Scape* blackish fuscous; *Antennae* light fuscous banded dark fuscous at lower ends of joints, the whole with purplish sheen. *Thorax* anteriorly dark brownish fuscous lightening to a pinkish brown crest, posterior end light straw narrowly edged chocolate; *Tegulae* anteriorly dark sooty brown lightening posteriorly to light pinkish brown. *Abdomen* light fuscous, segments edged laterally and posteriorly with light buff above, underside light buff brindled darkish brown, laterally sooty brown on 3, 4 and 5; anal tuft light fuscous. *Legs*: forelegs light buff brindled dark fuscous, tibiae and tarsi with pinkish sheen, tarsi dark fuscous ringed light fuscous at distal ends of joints; middle pair tibiae purplish fuscous edged buff, tarsal joints greyish fuscous above, buff below and at distal extremity; hindlegs tibiae light buff, hairy, lightly brindled brownish fuscous, long spurs light fuscous, short spurs dark fuscous buff tipped. *Forewings* dull brownish fuscous marked darkish fuscous on veins, costa closely maculated blackish and pinkish buff, lower base light buff with basal blackish spot bounded distally by blackish vertical line to centre line of wing; dorsum rusty brown to an obtuse angled blackish spot on centre line at about  $\frac{1}{3}$  followed by a small sooty black spot at  $\frac{1}{2}$  and a short narrow creamy vertical dash beyond  $\frac{1}{3}$ ; termen narrowly edged dark sooty brownish; cilia light pinkish fuscous, darker rings at middle and outer edge. *Hindwings* light straw shaded light fuscous at anal angle, cilia light straw outwardly light brownish fuscous.

*Larva* light green, almost white head with brownish jaws and brown side spots, dots black, V-VI in spun terminal shoots of *Salix*.

*Imago* VII-IX in England and Southern Scotland; abroad in Holland with a few records from Belgium and France; Germany to Western Russia, Austria.



## EPIGRAPHIA Steph.

A family of largish species with very oblique termen, forewings with 2 and 3 stalked, 7 to apex, hindwings with 3 and 4 connate, 5 nearly parallel. Palpi long and recurved, terminal joint much shorter than middle joint. The genus includes one British and one European species.

*Epigraphia steinkellneriana* Schiff. *Exp.* 22 mm. *Head*: face and crown rough scaled with fuscous and whitish brindled scales. *Palpi* apical joint pale fuscous brindled dark sooty brown at base and similarly brindled from about  $\frac{1}{2}$  to beyond  $\frac{3}{4}$ , apex plain ground colour; middle joint light fuscous outwardly brindled dark fuscous and similarly brindled inwardly at distal end. *Scape* dark fuscous and shining brown above, light and darker fuscous brindled elsewhere; *Antennae* greyish fuscous banded darker; basal  $\frac{1}{3}$  with whitish pubescence, outer  $\frac{2}{3}$  shortly ciliated. *Thorax* light fuscous anteriorly, a sooty fuscous crest on posterior half after which ground colour fuscous. *Tegulae* light fuscous becoming paler at edges and posteriorly. *Abdomen* and anal tuft mixed light and pale fuscous. *Legs*: forelegs with femora and tibiae light fuscous brindled darker, tarsi darkish fuscous with joints light banded distally, middle pair as forelegs but tarsi not banded; hindlegs light fuscous with spurs slightly darker and with a brownish tinge. *Forewings* basally fuscous shading off to whitish at tornus, costa obscurely strigulated sooty fuscous, a basal dark sooty dash followed by a strong flattened L-shaped mark in cell from  $\frac{1}{4}$  to  $\frac{1}{2}$  of the same colour with a coppery sheen, a double zigzag line from costa at  $\frac{2}{3}$  running in towards end of cell, then outwards and inwards again round end of cell; nervure terminations sooty fuscous on termen from before apex to anal angle; cilia rather long, light fuscous whitish tipped. *Hindwings* uniform light brownish fuscous, nervures slightly darker lined; cilia as forewings.

*Larva* slender, pale yellowish green with small green warts, dorsal line grass green marked yellowish; head and plates marked blackish, a small brown sclerite on each side of segment 10. VII-IX, under leaves of *Crataegus oxyacanthae*, *Pyrus aucuparia* to which Spuler adds *Sorbus*, *Prunus spinosa* and *Fraginus*.

*Imago* IV in England and Southern Scotland; abroad in France, Central Europe, Silesia and Northern Dalmatia to South-West Russia, also in North America.

## SEMIOSCOPIS Hb.

A genus of about 10 species distributed between North America and Europe to which Meyrick assigns also a doubtful Australian species, not referred to by Tillyard. Tongue short, antennae ♂ ciliate, labial palpi long, recurved, apical joint small and fine. Forewings with 7 to apex, hindwings, 3 and 4 connate, 5 nearly parallel.

*Semioscopis avellanella* Hb. *Exp.* 26 mm. *Head*: face light brownish buff, sepia round eyes, crown fuscous, light brownish buff above eyes. *Palpi* apical joint short and fine, fuscous buff; middle joint buff, sepia outwardly and below. *Scape* dark sepia above, fuscous below; *Antennae*

greyish fuscous widely banded dark fuscous, basal half simple, apical slightly ciliate. *Thorax* and *Tegulae* dark fuscous anteriorly, lightening posteriorly to light fuscous. *Abdomen* segments light fuscous centrally and posteriorly, slightly darker laterally above, heavily brindled dark sooty fuscous below. *Legs*: all femora buff, brindled lightish fuscous, forelegs with tibiae buff heavily brindled dark fuscous above, tarsi dark sooty fuscous, slightly lighter at distal end of each joint; middle pair with tibiae and tarsi as forelegs but slightly lighter; hindlegs with tibiae straw, long haired, long spurs light fuscous, short spurs slightly darker, tarsi brindled fuscous on last three joints. *Forewings* pale fuscous, an irregular sepia and coppery basal streak to  $\frac{1}{4}$ , then running into cell to  $\frac{1}{3}$ , a darkish V-shaped mark round the end of cell and area of apical nervures to costa brindled brownish fuscous, nervures very obscurely picked out and termen obscurely lined brownish fuscous; cilia whitish fuscous with two submedian bands of light brownish fuscous. *Hindwings* pale straw, finely light fuscous round margin, cilia pale straw, basally light fuscous.

*Larva* pale green showing dark viscera, head yellowish, VII-IX in web on underside of leaves of *Betula*, *Carpinus* and *Tilia parvifolia*.

*Imago* III-IV, locally in England Wales and Scotland to Perth; abroad in Scandinavia, Belgium, North and Central France, becoming rarer southwards, and Central Europe to Russia.

#### ENICOSTOMA Steph.

Tongue developed, ♂ antennae very shortly ciliated, palpi very long, middle joint heavily scaled, terminal joint short. Forewings with scale tufts, 7 to costa; hindwings 3 and 4 connate or approximated; monotypic.

*Enicostoma lobella* Schiff. *Exp.* 19 mm. *Head*: face fuscous white-tipped scales growing forwards from round eyes making a vertical ridge down face, crown similar, the scales growing forward, flat above and projecting beyond face. *Palpi* apical joint small, buff, banded fuscous from  $\frac{1}{2}$  to  $\frac{3}{4}$ , middle joint buff brindled fuscous, more darkly on outside. *Scape* hidden under head scales, dark fuscous above, buff below. *Antennae* greyish banded darkish fuscous, slightly ciliated. *Thorax* dark fuscous with posterior crest, *Tegulae* dark fuscous. *Abdomen* fuscous, ventrally darker, anal tuft fuscous. *Legs*: forelegs dark fuscous, tarsi banded ochreous distally on each joint, middle pair as forelegs, banding narrower; hindlegs similar but lighter, long spurs pale fuscous, short spurs fuscous. *Forewings* brownish fuscous, three small dark fuscous scale tufts in an almost vertical line slightly inclined outwards at  $\frac{1}{3}$  and two smaller tufts at end of cell, just beyond  $\frac{1}{2}$ , tornus brindled fuscous and whitish fuscous, termen marked darker fuscous between nervures; cilia brownish fuscous brindled whitish in middle and at outer end. *Hindwings* light fuscous slightly darker at apex and on margin; cilia whitish fuscous, light fuscous at apex.

*Larva* whitish green, dorsal line darker green with whitish oblique dashes on segments and whitish between segments; head whitish, two blackish dots on 2. VIII-IX under spun leaves of *Prunus spinosa*. Abroad Lhomme mentions also *Sorbus* (= *Pyrus*) *aucuparia*, *Crataegus*, and fruit trees, particularly Peach.

*Imago* VI in Southern England to Dorset, also in Norfolk. Abroad throughout France, Central Europe, North and Central Italy and Dalmatia. Lhomme mentions an occasional second brood in IX.

## FIELD MEETINGS, 1954.

OCKHAM, SURREY—10th April 1954.

Leader, Mr. F. RUMSEY.

The party met at Effingham Junction Station and were motored to Ockham Common. The weather conditions were ideal. Soon after their arrival at the wood the members had the pleasing experience of seeing six *Polygonia c-album* L. settled on a Sallow bush at the same time. Other imagines seen included *Xylocampa areola* Esp., *Panolis flammea* Schiff., *Gymnoscelis pumilata* Hb., *Archiearis parthenias* L., *Biston strataria* Hufn., *Selenia bilunaria* Esp., *Aglais urticae* L., *Nymphalis io* L., and *Gonepteryx rhamni* L. Larvae of *Parascotia fuliginaria* L. were found, the first record for this common. Other larvae noted were *Thera obeliscata* Hb. and *Ellopia fasciaria* L. (*prosapiaria* L.).

Birds noted were Green Woodpecker, Mistle-Thrush, Coal-Tit and Lapwing.

Rhododendrons that were in bloom in January were still in flower. Some exceptionally large blooms of the Lesser Celandine were noted. *Erophila verna* (L.) Chevall. was in bloom.

After tea several members explored Effingham Common with the aid of lamps and found imagines of *Earophila badiata* Schiff. and *Bapta distinctata* H.S. (*pictaria* Curt. nec Thnbg.) as well as many night feeding larvae.

BOXHILL, SURREY—17th April 1954.

Leader, Mr. F. T. VALLINS.

A party of fourteen assembled at Boxhill Station, and it was learned afterwards that two other members had arrived late and did not succeed in joining up with the main party. The day started well with sunshine, but before midday the sky clouded over and a cold northerly wind kept most insects grounded. By the station some wild white primroses were noticed.

The party proceeded through the meadows by the River Mole towards the stepping-stones. A mature nymph of the dragonfly *Agrion splendens* (Harris) was dredged from the river. A considerable quantity of the fallen catkins of the Black Poplar were collected, to breed out the beetle *Dorytomus longimanus* (Forst.). From bushes along the foot of the Downs, immature specimens of the cockroach *Ectobius lividus* (Fab.) were beaten, and the grasshopper, *Tetrix vittata* (Zett.), was also found. By beating the yews, larvae of the moth *Deileptenia ribeata* Clerck, were collected, and lichen covered branches of other trees produced larvae of *Eilema deplana* Esp. and *Laspeyria flexula* Schiff. One larva of the Dew Moth, *Setina irrorella* L., was found on the ground.

The afternoon was spent in Juniper Valley, and careful searching among stones by the coleopterists was well rewarded. One specimen of *Lebia chlorocephala* (Hoff.) was found, and the local, and usually scarce,

*Pilemostoma fastuosa* (Schaller), was discovered fairly easily by examining plants of *Inula* which showed signs of having been eaten. It was noted that this species seems to have become more common over the past few years. The interesting beetle, *Claviger testaceus* Preys., was discovered in considerable numbers in a nest of the ant, *Lasius flavus* (Fab.). One specimen of *Nargus anisotomoides* (Spence) was found under the bark of a dead beech tree.

Other beetles found were:—*Feronia madida* (Fab.), *Agonum ruficorne* (Goeze), *Microlestes maurus* (Sturm), *Hister 12-striatus* Schrank, *Thanasimus formicarius* (L.), *Drusilla canaliculata* (Fab.), *Adalia decempunctata* (L.), *Exochomus quadripustulatus* (L.), *Chrysolina violacea* (Muel.), *Timarcha goettingensis* (L.) and *Lochmaea crataegi* (Forster).

Hemiptera taken were:—*Thyreocoris scarabaeoides* L., under stones in Juniper Valley, *Acanthosoma haemorrhoidale* L., and *Eremocoris podagricus* Fab., one specimen on the southern slopes.

The following Agromyzidae were found:—*Melanagromyza lappae* Loew., puparia in stems of *Angelica sylvestris* L. (Wild Angelica); *M. aeneiventris* Fall., puparia in stems of *Pastinaca sativa* L. (Wild Parsnip); *Phytomyza ranunculi* Schrk., flies swept from flowers of *Mercurialis perennis* L. (Dog's Mercury).

#### OXSHOTT, SURREY—24th April 1954.

Leader, Mr. F. D. BUCK.

A total of thirteen members and visitors attended this meeting. The weather was dull and cold with little or no sunshine, but also with no rain—in fact, just as it was forecast. The party followed a trail that must have been beaten by thousands of "South London" members, across Oxshott Common, on to Esher Common and the Black Pond, then back to Oxshott for tea.

On some cut logs of birch and oak on which a small leathery fungus was growing the larvae of *Parascotia fuliginaria* L. was taken and was thought to be new to the district. Under the bark of the same logs *Silvanus unidentatus* (Ol.) was noted in numbers and with it the hemipteron *Xylocoris cursitans* (Fall.), also a single specimen of *Microlomachus flavicornis* (Hbst.) and several specimens of *Cryptophagus ruficornis* Steph. were captured.

Galls of *Aegeria flaviventris* Staud. were found on willow, and from an ants nest under bark the puparium of the Dipteron *Microdon eggeri* Mik. was taken. The larvae of *Ellopiia fasciaria* L. (*prosapiaria* L.) was reported and the larvae and pupae of the pyrale *Myelois neophanes* Durr. had been taken from the fungus *Daldinia concentrica* Ces. & de Nat.

Some interesting work was done on the sphagnum from the Black pond, and perhaps the best species taken were the Hemiptera, *Hebrus ruficeps* (Thoms.) and *Microvelia reticulata* (Burm.). Among the coleoptera taken in this way were *Euaesthetus ruficapillus* Boisd. & Lac.,

*Lathrobium brunnipes* (Fab.), and *L. fovulum* Steph., *Reichenbachia impressa* (Panz.) and *Acrotrichis thoracica* Waltl. The technique here used was gathering the sphagnum from just above the water level, wringing it out, searching it on the sheet, allowing it to dry and searching it again.

In the birch stumps *Rhagium bifasciatum* Fab. was quite plentiful though none of the beautiful varieties which have occurred in this area was noted. Amongst the frass and rubbish in some old hymenopterous tunnelings in one of these stumps was taken the larvae of *Otesias serra* (Fab.).

Working the base of heather later in the day several specimens of *Amara infima* (Dufts.) were captured though this scarce beetle, now so well known from this locality, did not evoke so much interest as the capture of a single specimen of the Hemipteron *Eurydema oleracea* (L.).

An excellent tea was taken at the "Hut" by the station and the subsequent discussion on the day's work was enlivened by the accidental escape of a lizard which had been taken by one of the party during the day—it was some minutes before it was safely back in the tin.

Species reported that have not been mentioned above were:—

COLEOPTERA: *Bradycellus ruficollis* Steph. at the roots of Ling, *Feronia diligens* Sturm. in wet moss, *Agonum gracile* Gyll. also in wet moss; *Philonthus fuscipennis* Mann. at the roots of Ling on Oxshott slope; *P. nigrita* Grav. in Sphagnum, Black Pond; *P. cephalotes* Grav. in old squirrels' drey; *Dinaraea aequata* Eric. under bark, Esher Common; *Dadobia immersa* Eric. under bark, Esher Common; *Lathrobium terminatum* Grav. common in Sphagnum, Black Pond; *Ochtheophilum fracticorne* Payk. in wet moss; *Stenus rogeri* Kraatz, in wet moss; *Tachyporus transversalis* Grav. commonly in damp refuse; *T. hypnorum* Fab. in vegetable refuse; *T. chrysomelinus* L. also in vegetable refuse; *Euconnus hirticollis* Ill. in sphagnum, Black Pond; *Cerylon ferrugineum* Steph. under bark, Esher Common; *Bitoma crenata* Fab. under bark, Esher Common; *Rhizophagus bipustulatus* Fab. under bark, Esher Common; *Cylindronotus laevioctostriatus* Goeze at roots of Ling, Oxshott, *Coeliodes rubicundus* Hbst. in wet moss.

The following leaf mining Diptera were noted:—*Phytomyza loniceræ* R.D. (*Lonicera periclymenum* L.), *Phytomyza ilicis* Curtis (*Ilex aquifolium* L.).

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#### BOOKHAM COMMON, SURREY—2nd May 1954.

Leader, Mr. D. LESTON.

Owing to the continuous rain very little could be done. The only report received was of the following leaf-mining Diptera:—*Melanagromyza lappæ* Lw. (*Cirsium* sp., *Angelica sylvestris* L.), *Melanagromyza simplicoides* Hd. (*Salix* sp.), *Phytomyza loniceræ* R.D. (*Lonicera periclymenum* L.), *Phytomyza ilicis* Curtis (*Ilex aquifolium* L.).

EFFINGHAM (BARNS THORNS WOOD), SURREY—8th May 1954.

Leader, Mr. T. R. EAGLES.

It was a beautiful sunny day and the wood was very dry. Parts that were usually wet were negotiated with ease.

Galls of *Aegeria flaviventris* Staud. were found on the willows in good numbers but about a quarter of them had been pecked out by birds.

Much hard work was done turning over logs in search of larvae of *Parascotia fuliginaria* L. and upwards of 20 were found, mostly fairly small.

The usual Spring butterflies were plentiful, especially both sexes of *Gonepteryx rhamni* L.

Primroses, bluebells and wood anemones were in bloom. Nightingales were in full song and the chiff-chaff, willow warbler and whitethroat were often heard. Cuckoos of both sexes were calling.

The following Coleoptera were taken:—*Vicindela campestris* L., *Acupalpus meridianus* L., *Ptomophagus subvillosus* Goeze, *Conosomus littoreus* L., *Anthobium* (*Lathrimaeum*) *atrocephalum* Gyll., *Agriotes lineatus* L., *Meligethes picipes* Sturm., *Epuraea unicolor* Ol. (*obsoleta* Fab.), *Librodor quadriguttatus* Fab., *L. hortensis* L. (*quadripunctatus* Ol.), *Biphylus lunatus* Fab., *Cis festivus* Gyll., *Pyrochroa serraticornis* Scop., *Anaspis pulicaria* Costa, *Chrysolina varians* Schall. and *Anthonomus pomorum* L.

The leaf-mining fly *Melanagromyza simplicoides* Hd. was noted on Sallow.

SALCEY FOREST, NORTHANTS.—15th May 1954.

Leaders, Messrs. S. W. HUMPHREY and A. S. WHEELER.

Disappointing weather greeted a party of 28 who travelled by coach, to be joined by Mr. S. W. Humphrey later. The day was entirely without sunshine; the temperature was well below average for the time of year and the forest was saturated by heavy rain earlier in the morning.

The section of forest north east of the crossroads was the centre of activities. Although the lepidopterists searched many willows, larvae of *Apatura iris* L. were not found. It was learned, however, that rides near the coach parking spot and the lunch rendezvous are normally reliable places for the species. Better fortune awaited those beating for *Strymonidia pruni* L., and some 20 or 30 larvae, about half-grown, were taken. Other records of larvae are:—*Strymonidia w-album* Knoch, *Trichiura crataegi* L., *Episema caeruleocephala* L., *Brachionycha sphinx* Hufn., *Alucita galactodactyla* Schiff. (on burdock) and *Acrobasis consociella* Hb. (on oak). A few imagines of *Euchloë cardamines* L. and two *Leptidea sinapis* L. were found at rest and ova of the former were common. A specimen of *Sarrothripus revayana* Scop. was also taken.

Coleoptera reported were:—*Dasytes aerosus* Kies., beaten from dead twigs; *Kateretes bipustulatus* Payk., *Ceuthorhynchus cochleariae* Gyll.,



*C. erysimi* Fab. and *C. contractus* Marsh., all on *Cardamine pratensis* L.  
The most interesting plant seen was *Alchemilla vestita* (Buser) Raunk.

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STANFORD-LE-HOPE, ESSEX—22nd May 1954.

Leader, Mr. R. D. WEAL.

Seven members attended this meeting, and although the weather was rather chilly with light showers in the early morning, it improved, and at no time did it interfere with collecting. The route taken was the same as on the Society's two previous visits to this locality (1951-52). Tea was taken at the "Crossways" as usual, and a search made on the outside of the windows and doors of the mill on the way back to the station. The following insects were noted:—

LEPIDOPTERA:—Imagines of *Epichnopteryx pulla* Esp., *Phalonia smeathmanniana* Fab., and *Hemimene simpliciana* Haw. Larvae of *Euproctis chrysorrhoea* L., *Philudoria potatoria* L., *Apamea ypsilon* Schiff., *Anania nubilalis* Hb., *Lozopera beatricella* Wals. and *Nemotois fasciella* Fab.

HEMIPTERA:—*Legnotus limbosus* Geoff. in Fourc. and *Podops inuncta* Fab.

COLEOPTERA:—*Ophonus brevicollis* Dej., *Harpalus aeneus* Fab., *H. melancholicus* Dej., *Amara aenea* Deg., *Bembidion dentellum* Thunb., *B. varium* Ol., *B. assimile* Gyll., *B. articulatum* Panz., *Dromius linearis* Ol., *Brachinus crepitans* L., *Silpha tristis* Ill., *Phosphuga atrata* L., *Rybaxis longicornis* Leach., *Anisosticta 19-punctata* L., *Subcoccinella 24-punctata* L., *Propylea 14-punctata* L., *Thea 22-punctata* L., *Scymnus redtenbacheri* Mulsant, *Dacne bipustulata* Thunb., *Oryzaephilus surinamensis* L., *Mycetophagus 4-pustulatus* L., *Attagenus pelli* L., *Agriotes sputator* L., *Cantharis rufa* L., *Ptinus hirtellus* Sturm., *Bruchus atomarius* L., *B. lentis* Fl., *B. rufimanus* Boh., *Blaps mucronata* Lat., *Chrysolina banksi* Fab., *Gastrophysa polygoni* L., *Phaedon tumidulus* Germ., *Phyllotreta nigripes* Fab., *Podagrica fuscipes* Fab., *Mantura rustica* L., *Palorus subdepressus* Woll., *Apion malvae* Fab., *A. radiolus* Kirby., *A. carduorum* Kirby., *Phyllobius parvulus* Ol., *Rhynchaenus alni* L., *Sibinia potentillae* Germ., *Mecinus janthinus* Germ., *Cidnorrhinus 4-maculatus* L., *Ceuthorhynchus pollinarius* Forst., and *C. turbatus* Schz.

ODONATA:—*Ischnura elegans* van der Lind.

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CHAILEY, SUSSEX—30th May 1954.

Leader, Mr. D. A. ODD.

Over 20 members and friends attended this meeting and were rewarded with perfect weather. Mr. Odd met the party at Haywards Heath Station, and thanks to the combined efforts of those with cars everyone was transported to the leader's house situated a few minutes' walk from Chailey Common, where the day's operations were conducted.



Lepidoptera taken included:—*Eulype hastata* L., *Eilema sororcula* Hufn., *Stenoptilia bipunctidactyla* Scop., *Lobesia reliquana* Hb., (*permixtana* Hb., nec Schiff.), *Eucosma rheedianna* Haw., *Pammene germanana* Hb., *Borkhausenia tinctella* Hb., and *Adela fibulella* Schiff. Larvae of *Thecla quercus* L. were to be had in numbers by beating the oaks, which trees also yielded larvae of *Asphalia diluta* Schiff. and small *Polyphoca ridens* Fab. By searching the trunks, larvae of *Gripesia aprilina* L. were to be had. Other larvae taken were *Trichiura crataegi* L., *Poecilocampa populi* L., *Apamea ypsilon* Schiff. (under loose bark on an old willow), and a few *Crambus paludellus* Hb. (in old stems of *Typha latifolia*).

Other insects recorded were the bee *Anthophora acervorum* L. (common on a bank where some members had lunch); the Hemiptera *Piezodorus lituratus* Fab. (several taken on gorse); *Nabis rugosus* L., *Calocoris ochromelas* Gmel. and *Cyllocoris flavoquadrimaculatus* Deg., the Orthoptera *Tetrix subulata* L. and *T. vittata* Zett.; and the Odonata *Pyrrosoma nymphula* Sulz., *Coenagrion puella* L. and *Libellula depressa* L.

The following is a list of the beetles taken by industrious coleopterists present:—*Elaphrus cupreus* Duft., *Bembidion articulatum* Panz., *B. biguttatum* Fab., *Stenolophus mixtus* Hb., *Acupalpus luridus* Dej., *Agonum ruficorne* Goeze, *Dromius linearis* Ol., *D. meridionalis* Dej., *D. quadrinotatus* Panz., *Cercyon subsulcatus* Rey (*sternalis* Sh.), *Catops fuscus* Panz., *Anisosticta 19-punctata* L., *Adalia 10-punctata* L., *Meligethes atratus* Ol. (*rufipes* Marsh.), *M. aeneus* Fab., *M. viridescens* Fab., *M. picipes* Sturm., *Athous haemorrhoidalis* Fab., *Prosternon tessellatum* L., *Agriotes acuminatus* Steph., *A. pallidulus* Ill., *Cantharis livida* L., *C. rufa* L., *C. pellucida* Fab., *Metacantharis clypeata* Fab., *Malachius bipustulatus* L., *Cyphon variabilis* Thunb., *C. ochraceus* Steph., *Dasytes aerosus* Kies., *Byturus urbanus* Lind., *Hedobia imperialis* L., *Grynobius excavatus* Kugl., *Grammoptera ruficornis* Fab., *G. holomelina* Pool, *Tetrops praeusta* L., *Alosterna tabacicolor* Deg., *Bruchus loti* Payk., *Pyrochroa coccinea* L., *Orsodacne lineola* Panz., *Donacia vulgaris* Zsch., *Plateumaris sericea* L., *Chrysolina polita* L., *Phaedon armoraciae* L., *Lochmaea crataegi* Forst., *Chalcoides aurea* Geoff., *C. aurata* Marsh., *C. nitidula* L., *Chaetocnema concinna* Marsh., *Anaspis frontalis* L., *A. maculata* Geoff., *Caenorhinus germanicus* Hbst., *C. aequatus* L., *Rhynchites caeruleus* Deg., *Apion ulicis* Forst., *Phyllobius pomaceus* Gyll. (*urticae* Deg. nec Scop.), *P. virideaeris* Laich. (*pomonae* Ol.), *P. pyri* L., *P. argentatus* L., *Polydrusus tereticollis* Deg., *Sitona lineatus* L., *Notaris scirpi* Fab., *Dorytomus taeniatus* Fab., *Anthonomus pedicularius* L., *A. rubi* Hbst., *Curculio* (*Balaninus*) *villosus* Fab., *C. (B.) venosus* Grav.

The following is a list of the Agromyzidae mines reported:—*Liriomyza trifolii* Burgess (*Trifolium* sp.), *Phytagromyza lonicerae* R.D. (*Lonicera periclymenum* L.), *Phytomyza conopodii* Hg. (*Conopodium majus* (Gouan) Lor. & Barr.), *P. crassiseta* Zett. (*Veronica* sp.), *P. primulae* R.D. (*Primula vulgaris* Huds.), *P. pseudohellebori* Hd.

(*Ranunculus bulbosus* L.), *P. ranunculi* Schrank (*Ranunculus flammula* L.), *Napomyza glechomae* Kalt. (*Glechoma hederacea* L.). Empty mines were also taken of: *Phytomyza anthrisci* Hd. (*Anthriscus sylvestris* (L.) Bernh.), *P. ilicis* Curtis (*Ilex aquifolium* L.). *Phytomyza anemones* Hg. new to Britain was taken on *Anemone nemorosa* L. The type female of *Agromyza rubiginosa* Griffiths was swept (cf. *Ent. Gaz.*, 6: 62).

While having lunch, a pair of Willow Warblers were seen to visit a patch of low gorse nearby and, on examining the spot, the nest and eggs were found well hidden among the herbage.

At about 5 o'clock the party returned to Mr. Odd's house, where Mrs. Odd and helpers were waiting with most welcome refreshments after the day's exertions. Once again the cars were filled to capacity for the return to Haywards Heath Station. This proved to be a most enjoyable meeting, thanks in no small measure to Mr. and Mrs. Odd and their helpers.

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#### BENFLEET, ESSEX—5th June 1954.

Leader, Mr. F. M. STRUTHERS.

Eleven members and friends attended. The weather was warm and sunny. During the morning the slopes East of the station were worked, but after lunch the party went along the sea wall. Apart from the small amount of necessary repair work which had been done to the mainland wall since the historic flood of 1953, there was by now little trace of damage in that area. Lepidoptera taken or noted included imagines of *Chiasmia clathrata* L., *Euxanthis aeneana* Hb. and *Adela fibulella* Schiff. Larvae of *Aglais urticae* L. were abundant on the nettles. Also taken were larvae of *Euproctis chrysorrhoea* L. (*phaeorrhoea* Don.), *Malacosoma neustria* L., *Platyptilia rhododactyla* Schiff., *Coleophora solitariella* Zell. and *C. conspicuella* Zell. and larvae and pupae of *Thetidia smaragdaria* Fab.

Amongst the Coleoptera taken were *Ceuthorhynchus turbatus* Schultze (common on *Cardaria draba* (L.) Desv. (Hoary Pepperwort), (cf. *Ent. mon. Mag.*, 87: 309)), *Harpalus rubripes* Duft., *Saprinus semistriatus* Scriba (in dead jackdaw), *Anthocomus fasciatus* L., *Coccidula rufa* Hbst., *C. scutellata* Hbst., *Anisosticta 19-punctata* L., *Agabus conspersus* Marsh., *Ochthebius viridis* Peyr., *O. minimus* Fab., and from ditches on Canvey Island *Haliphus apicalis* Thoms., *Coelambus parallelogrammus* Schall. and *Bagous limosus* Gyll. A specimen of *Chrysolina oricalcia* Müll. was also taken.

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#### PRINCES RISBOROUGH, BUCKS.—12th June 1954.

Leader, Mr. H. E. WEBB.

It was a very wet day, the sort of day that was to become only too familiar as the "Summer" of 1954 proceeded. Beating for larvae was impossible; in fact, it was necessary to keep to the road and paths.

Nevertheless, the following Lepidoptera were noted:—Ova of *Hamearis lucina* L. and of *Gonepteryx rhamni* L.; larvae of *G. rhamni*, *Cucullia verbasci* L., *Philudoria potatoria* L., *Gastropacha quercifolia* L. and *Arctia caja* L.; larvae and pupae of *Alucita galactodactyla* Schiff. on burdock and imagines of *Polyommatus icarus* Rott., *Aricia agestis* Schiff., *Pararge megera* L., *Callimorpha jacobaeae* L., and *Epirrhoe alternata* Müll.

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#### BETCHWORTH, SURREY—20th June 1954.

Leader, Mr. D. W. THORPE-YOUNG.

Those attending this meeting were rewarded by having a sunny day. The party proceeded to the downs, where about half a dozen species of our common butterflies were noted, including *Pararge aegeria* L. Moths reported included:—*Diacrisia sannio* L., *Setina irrorella* L., ♂ and ♀ (an early date in an otherwise late season), *Ectypa glyphica* L., *Scopula ornata* Scop., *Cepphis advenaria* Hb., *Marasmarcha lunaedactyla* Haw. and *Oecophora geoffrella* L.

Several species of Orchids were found, including:—*Aceras anthropophorum* (L.) S. F. Gray (Man Orchis), *Ophrys apifera* Huds. (Bee Orchis) and *Gymnadenia conopsea* (L.) R. Br. (Fragrant Orchis).

The following leaf-mining Diptera (Agromyzidae) were taken:—*Phytobia labiatarum* Hd. (*Stachys sylvatica* L.), *Agromyza anthracina* Mg. (*Urtica dioica* L.), *A. nana* Mg. (*Medicago lupulina* L.), *A. reptans* Fall. (*Urtica dioica* L.), *A. rufipes* Mg. (*Myosotis* sp.), *A. spiraeae* Kalt. (*Potentilla reptans* L., *Agrimonia eupatoria* L.), *Liriomyza trifolii* Burgess (*Trifolium* sp.), *Phytomyza anthrisci* Hd. (*Anthriscus sylvestris* (L.) Bernh.), *P. atricornis* Mg. (*Sonchus* sp.), *P. brunnipes* Brischke (*Sanicula europaea* L.), *P. chaerophylli* Kalt. (*Chaerophyllum temulum* L.), *P. conyzae* Hd. (*Inula conyza* DC.), *P. crassisetia* Zett. (*Veronica* sp.), *P. lappina* Hd. (*Arctium* sp.), *P. melana* Hd. (*Pimpinella saxifraga* L.), *P. nigra* Mg. (*Triticum* sp.), *P. obscura* Hd. (*Origanum vulgare* L.), *P. pastinacae* Hd. (*Pastinaca sativa* L.), *P. ramosa* Hd. (*Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *P. ranunculi* Schrank (*Ranunculus* sp.), *P. spondylii* R.D. (*Heracleum sphondylium* L.), *P. sphondylivora* Spencer (in litt.) from *Heracleum sphondylium* L., *P. vitalbae* Kalt. (*Clematis vitalba* L.). Empty mines were also taken of: *Napomyza glechomae* Kalt. (*Glechoma hederacea* L.), *Phytomyza ilicis* Curtis (*Ilex aquifolium* L.).

The following were swept:—*Agromyza flavipennis* Hd., *A. nigrociliata* Hd., *Phytomyza nigra* Mg., *P. ranunculi* Schrank.

About 5 o'clock the party had tea at the Barley Mow after a thoroughly enjoyable ramble in this fine locality.

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#### FAVERSHAM, KENT—27th June 1954.

Leaders, MESSRS. DUDLEY G. MARSH and G. H. YODEN.

This was one of the few days on which rain did not interfere with the outing. The sun shone occasionally and the wind was fairly strong.

Twenty-four members and friends assembled at Faversham Station and were taken by cars to the Faversham Creek where the walk along the banks produced a large variety of insects of all orders.

A few common butterflies and moths were seen flying but larvae hunting was the most productive. Several nests of quite small larvae of *Malacosoma castrensis* L. were found while the larger larvae were plentiful singly and easy to find, near the water. Larvae of *Cucullia chamomillae* Schiff. occurred on the food plant and some fine looking fully fed larvae were obtained. Some larvae of *Catocala nupta* L. were found on the bark of willows, while the reeds produced a larva of *Nonagria geminipuncta* Haw.

Other species of lepidoptera captured included:—*Homocosoma sinuella* Fab., *Agdistis bennetii* Curt., *Phalonia smeathmanniana* Fab., *P. affinitana* Dougl., *Eucosma citrana* Hb., *Hemimene petiverella* L., and *H. politana* Hb.

The very local plant *Peucedanum officinale* (L.) Moench. (Hog's Fennel) is abundant in this locality and many larvae of *Depressaria putridella* Schiff. were found in the spun shoots which were so conspicuous on practically every plant. Most of these larva were distended with parasites and comparatively few moths were eventually bred.

By sweeping the large clumps of *Cardaria draba* (L.) Desv. (Hoary Cress) growing on the sea wall many larvae of *Plutella maculipennis* Curt. were found, together with the beetle *Ceuthorrhynchus turbatus* Schultze. The latter was added to the British List as recently as 1951 by Mr. J. L. Henderson (see *Ent. mon. Mag.*, **87**: 209).

Other species of Coleoptera recorded were as follows: *Dyschirius lüdersi* Wag., *Loricera pilicornis* Fab., *Badister bipustulatus* Fab., *Dicheirotichus gustavii* Crotch. (*pubescens* Payk. nec Müll.), *Harpalus rubripes* Dfts., *H. tardus* Panz., *Anisodactylus poeciloides* Steph., *Feronia* (*Pterostichus*) *diligens* Sturm., *Bembidion biguttatum* Fab., *B. lunulatum* Geoff. in Fourc., *B. assimile* Gyll., *B. articulatum* Panz., *B. minimum* Fab., *B. normannum* Dej., *B. genei* Ku. v. *illigeri* Net., *B. varium* Ol., *Agabus nebulosus* Forst., *Halobrecta flavipes* Thom., *Creophilus maxillosus* L., *Staphylinus* (*Ocypus*) *pedator* Grav. (the best capture), *Paederus litoralis* Grav., *Stenus juno* Payk., *S. clavicornis* Scop., *S. ossium* Steph., *S. aceris* Steph., *Bledius limicola* Tott., *Omosita colon* L., *Microcara testacea* L., *Corticaria impressa* Ol., *Otesias serra* Fab., *Athous haemorrhoidalis* Fab., *Rhagonycha limbata* Thom., *Cantharis lateralis* L., *Malachius bipustulatus* L., *Necrobia violacea* L., *Anobium fulvicorne* Sturm., *Laria dulcamarae* Scop., *Haltica palustris* Weise, *Phyllotreta nigripes* Fab., *Crepidodera ferruginea* Scop., *Chalcoides aurata* Marsh., *Psylliodes affinis* Payk., *Rhinosimus planirostris* Fab., *Anthicus quisquilius* Thom., *Apion pomonae* Fab., *A. meliloti* Kirby, *Otiorrhynchus singularis* L., *Sitona lineatus* L., *Phytonomus posticus* Gyll. (*variabilis* Hbst. nec Fab.).

A number of *Salda littoralis* L. (Hem.)—adults and nymphs—were found among the debris of the nest of a wild duck on the salterns.

Our dipterists reported the following Agromyzidae:—*Phytobia artemisiae* Kalt. (*Artemisia vulgaris* L.), *P. humeralis* v. Ros. (*Aster tripolium* L.), *Agromyza anthracina* Mg. (*Urtica dioica* L.), *Phytomyza albiceps* Mg. (*Artemisia vulgaris* L.), *P. atricornis* Mg. (*Lepidium latifolium* L., *Papaver* sp., *Vicia sepium* L.), *P. chaerophylli* Kalt. (*Chaerophyllum temulum* L.). Empty mines were taken of *Phytomyza lappina* Hd.

The following were swept:—*Phytobia humeralis* v. Ros., *Melanogromyza aeneiventris* Fall. (in large numbers, presumably feeding on *Aster tripolium* L.), *Phytomyza asteris* Hd., *Liriomyza strigata* Mg., *Pseudonapomyza atra* Mg., *Napomyza lateralis* Fall.

Tea was taken in Faversham at The Bun Shop, which kindly opened its doors specially to the party who were in need of refreshment after a busy day. A very well attended and successful meeting—one of the best held during the season.

HOLMBURY ST. MARY, SURREY—4th July 1954.

Leader, Mr. R. F. HAYNES.

After the cool, wet weather of recent weeks, it was a pleasant change to enjoy several hours of bright sunshine during this field meeting. The wind, however, continued strong all day and on at least two occasions the party was compelled to take shelter during heavy rainstorms.

About half a dozen members and a visitor assembled at Dorking North station and at once proceeded by bus to Parkhurst Corner. From here the party set out along the road leading south in the direction of Leith Hill, examining fences and beating undergrowth. A pair of *Mimas tiliae* L. were noticed in cop. on a birch trunk.

Several moths were either captured or noted, including:—*Triphaena pronuba* L., *Rivula sericealis* Scop., *Mesoleuca albicillata* L., *Hydrelia flammeolaria* Hufn., *Perizoma flavofasciata* Thunb. and *Bupalus piniaria* L.

A halt was called for lunch near Leith Hill and afterwards, retracing steps to High Ashes Farm, a footpath was followed along devious ways through field and woodland to Holmbury St. Mary. Two species only of butterflies were noticed, *Pararge aegeria* L. and *Maniola jurtina* L.

Having nearly a whole hour to spare before tea, the party explored a large woodland clearing and here a few micro lepidoptera were flushed out of the herbage. Mr. Wakely kindly identified the following species:—*Pyrausta* (*Anania*) *funnebris* Stroem (*octomaculata* L.), *Perinephela lancealis* Schiff. and *Scoparia cembrae* Haw.

Some larva beating was attempted but results were very meagre. Single caterpillars only of *Achlya flavicornis* L. and *Lymantria monacha* L. were taken in addition to a host of small loopers. Some micro larvae were collected:—*Mompha nodicolella* Fuchs and *M. raschkiella* Zell. A great profusion of wild golden rod, *Solidago virga-aurea* L., was noticed growing beside woodland paths.

Lastly, a pleasant tea was enjoyed by all members at the Royal Oak tea-rooms in Holmbury St. Mary village; after which everyone returned by bus to Dorking.

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# HORSELL COMMON, NEAR WOKING, SURREY—11th July 1954.

Leader, Baron DE WORMS.

A fine and dry day greeted the eight members of the Society, including the leader, who assembled at Woking station. The route taken lay over the eastern end of the Common. The earliness of the season was evinced by the continued presence in numbers of *Ematurga atomaria* L. and of *Perconia strigillaria* Hb., of which the females were most prevalent. That striking Arctiid *Diacrisia sannio* L. seemed to fly up at every step, but only two females were obtained. In a boggy patch one example of *Heliothis maritima* Grasl. was taken and a few others were seen. A fresh female of the large Emerald, *Geometra papilionaria* L. was found at rest and towards the end of the day a superb *Hyloicus pinastri* L. was observed on a small pine. *Plebejus argus* L. was almost absent. Galls of *Mompha nodicollella* Fuchs were noted in the stems of the rosebay willowherb. Small larvae of *Anarta myrtilli* L. were taken as well as those of *Dasychira fascelina* L. Tiger beetles were in numbers and among the dragon-flies the most striking noted were *Anax imperator* Leach and *Cordulegaster boltonii* Don. In the bird world the most notable find was a young Nightjar after its mother had been flushed. Three nests of wood-lark with eggs were found.

The very enjoyable day ended with a very pleasant tea at the Wheat-sheaf Hotel in Woking.

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# SLADE GREEN, KENT—18th July 1954.

Leader, Mr. C. H. HARDS.

About a dozen attended this meeting, including members from Herne Bay and Dover. Leaving the station, the party proceeded towards the Thames along a lane in which a fair number of specimens of *Sterrha vulpinaria* H.-S. (*rusticata* Schiff. auct. nec Schiff.) were taken. Unfortunately this local species was not so plentiful as is often the case. Larvae of *Hypena rostralis* L. were also taken by beating the hops growing in the hedges. A single specimen of *Aegeria tipuliformis* Clerck was captured. Larvae of *Phtheocroa rugosana* Hb. were found in the spun shoots of White Bryony (*Bryonia dioica*).

After lunch, a move was made to the Erith Marshes. Here specimens of *Pyrausta (Anania) nubilalis* Hb., were taken together with *Phalonia rubigana* Treits. (*badiana* Hb. nec Schiff.). Several webs of *Nymphalis io* L. were noted, while odd larvae captured included *Phragmatobia fuliginosa* L. and *Arctia caja* L. Full-grown larvae of *Gortyna flavago* Schiff. were taken in stems of Burdock and Ragwort—chiefly in the latter plant. By collecting flowers and seeds of the Common Mallow

(*Malva sylvestris*) a number of larvae of *Platyedra vilella* Zell. were taken, while at one spot the larvae of *Phthorimaea atriplicella* F.R. were found in numbers in spun shoots of *Chenopodium*.

Plants of botanical interest were the vetch *Coronilla varia* L., which was growing in large clumps, and a well-established growth of *Artemisia absinthium* L. on the side of one of the banks built to keep high tides from flooding the fields.

A specimen of the Syrphid fly *Chrysotoxum verralli* Collin was reported.

The following is a list of the Agromyzid fly mines noted in this locality: *Phytobia artemisiae* Kalt. (*Artemisia vulgaris* L.), *P. humeralis* v. Ros. (*Aster tripolium* L.), *P. labiatarum* Hd. (*Ballota nigra* L.), *Agromyza reptans* Fall. (*Urtica dioica* L.), *Liriomyza sonchi* Hd. (*Sonchus oleraceus* L.), *Phytomyza tridentata* Lw. (*Salix* sp. ? *viminialis* L.), *Napomyza lateralis* Fall. (*Matricaria chamomilla* L.), *Phytomyza albiceps* Mg. (*Artemisia vulgaris* L.), *P. atricornis* Mg. (*Lactuca serriola* L., *Lepidium latifolium* L., *Brassica* sp., *Linaria* sp., *Senecio jacobaea* L.), *P. lappina* Hd. (*Arctium* sp.), *P. matricariae* Hd. (*Matricaria chamomilla* L.), *P. ranunculi* Schrank (*Ranunculus* sp.). Empty mines were also taken of:—*Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Garcke), *Liriomyza amoena* Mg. (*Sambucus nigra* L.), *Phytomyza affinis* Fall. (*Cirsium arvense* (L.) Scop.), *P. anthrisci* Hd. (*Anthriscus sylvestris* (L.) Bernh.), *P. cirsii* Hd. (*Cirsium arvense* (L.) Scop.), *P. petoi* Hg. (*Mentha* sp.).

A pleasant tea was enjoyed on the front at Erith in the public gardens overlooking the Thames.

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#### CHOBHAM, SURREY—24th July 1954.

Leader, Mr. R. M. MERE.

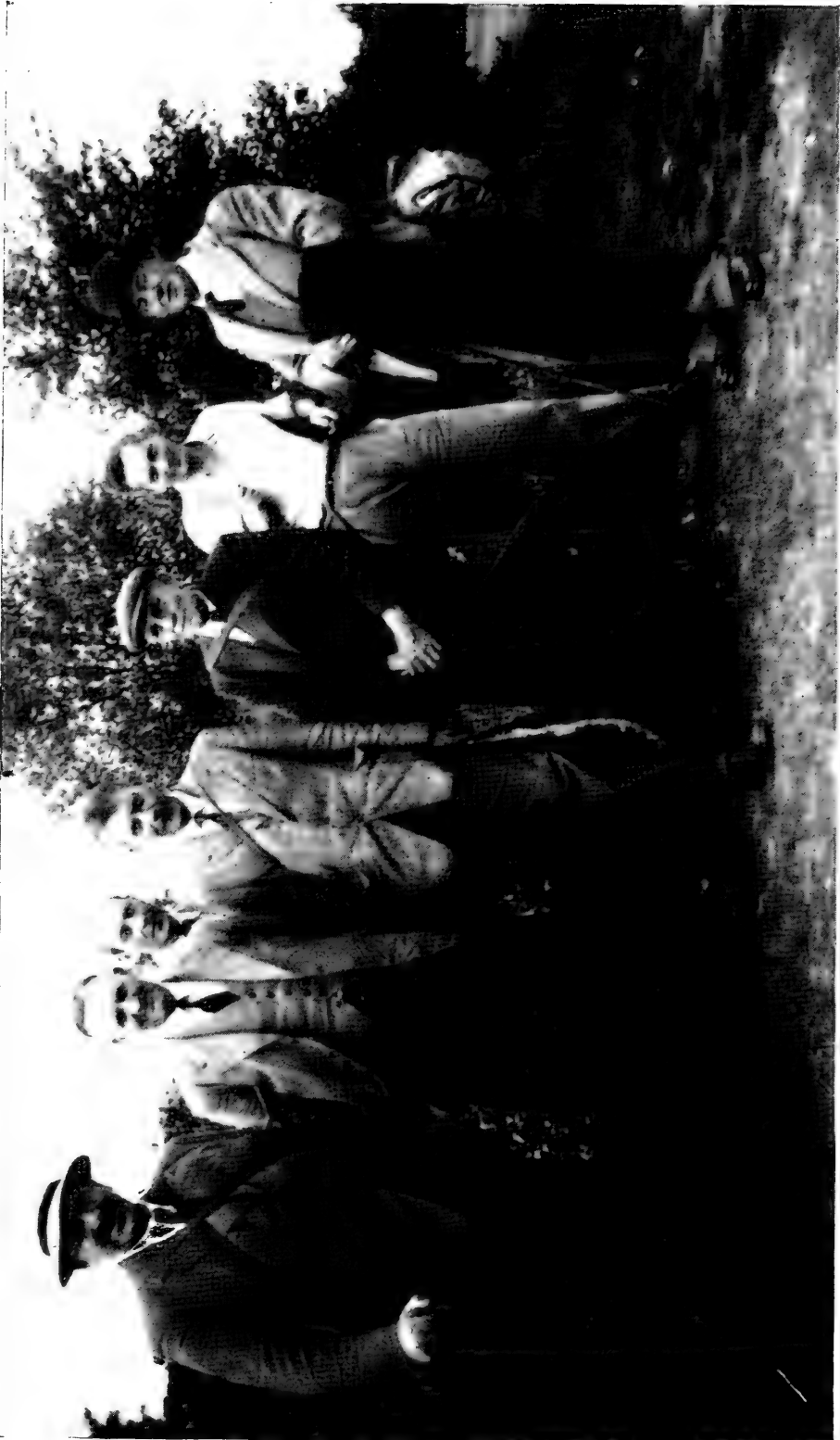
Eight members attended, but unfortunately owing to a misunderstanding all did not meet at the starting point, so that there were two groups of members working different parts of Chobham Common who did not meet until nearly 4 p.m.

The weather was dull, with drizzle at times, until well into the afternoon when there was a little sunshine. There was a warm S.W. wind.

The area consisted of the usual type of Surrey common with heather, gorse, birch and a little pine, but in addition there were boggy areas with large patches of bog asphodel in flower.

The commonest butterfly was *Plebejus argus* L. which was just emerging and in beautiful condition. Six other species of butterfly were on the wing. There were several moths of interest. A faded *Chlorissa viridata* L. was seen and a number of fresh *Sterrhia muricata* Hufn. taken. Among coarse grasses in the damper spots *Tholomiges turfosalis* Wocke was abundant. *Sterrhia emarginata* L. and *Diacrisia sannio* L. were seen. *Dasychira fascelina* L. was present in three

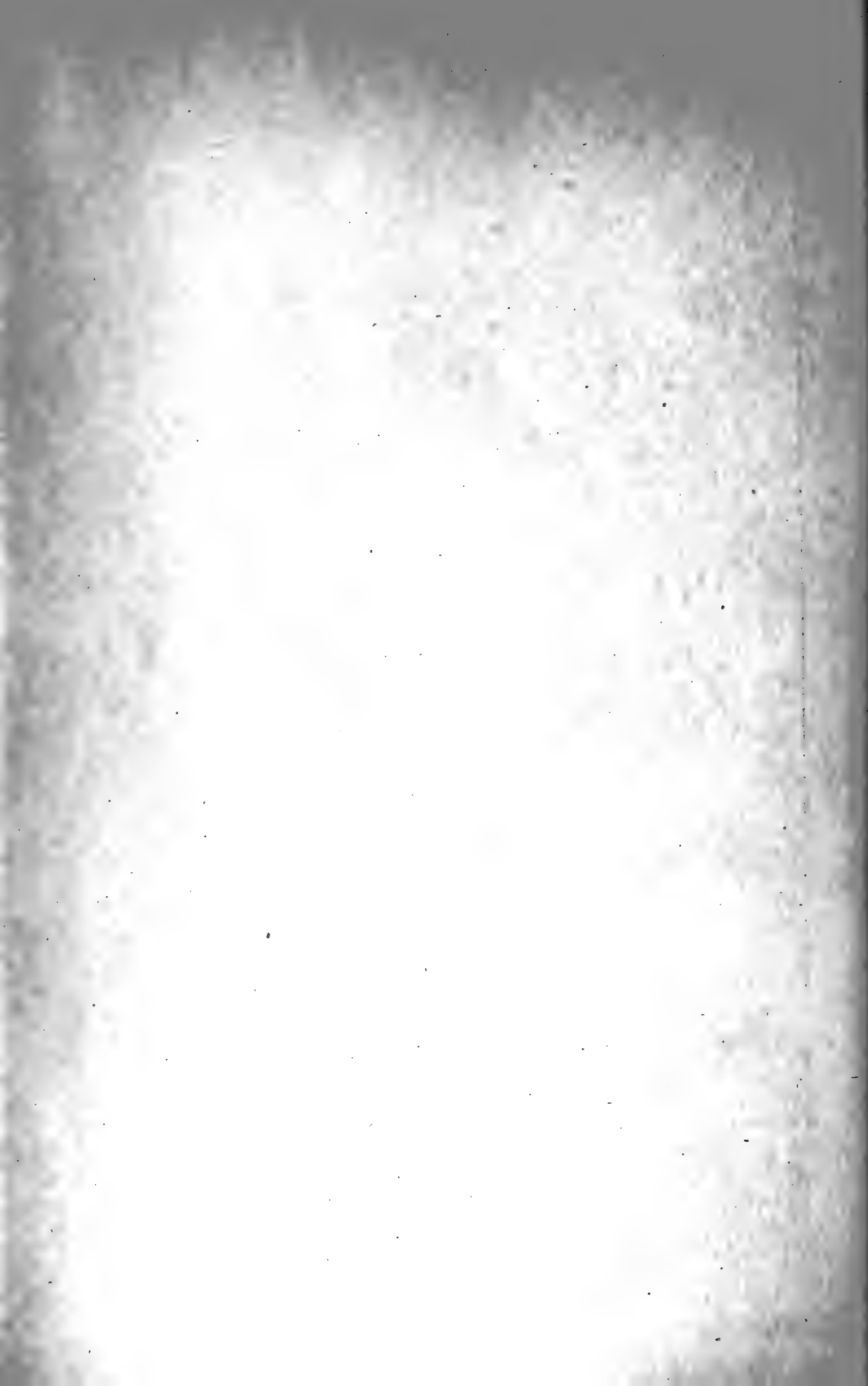




Horsell, Surrey (11th July 1954).

Dr. C. G. M. de Worms, S. Wakely, J. L. Messonger, R. F. Bretherton, F. Runsey, A. S. Wheeler, Sir Leonard Wakely.





stages—a batch of ova on a grass stem, larvae (apparently all parasitised) and one worn imago. There were two stages of *Anarta myrtili* L.—larvae and imagines.

Micro-lepidoptera were represented by *Depressaria umbellana* Steph. (larvae abundant on gorse), *Ypsolophus lucellus* F. (disturbed from oak bushes), *Nymphula nymphaeata* L., *Dioryctria fusca* Haw., *Crambus pinellus* L., *C. uliginosellus* Zell., *C. perlellus* Scop., *Cacoecia pronubana* Hb., *Eucosma cruciana* L. and *Ancylis siculana* Hb.

A young nightjar was flushed, reed buntings were seen and meadow pipits were singing.

The more interesting plants seen were:—*Melilotus alba* Desr., *Trifolium arvense* L., *Lotus uliginosus* Schkuhr., *Drosera rotundifolia* L., *D. intermedia* Drev. & Heyne, *Calystegia sylvestris* (Willd.) Roem. & Schult., *Filago minima* (Sm.) Pers., *Gnaphalium sylvaticum* L., *Cirsium dissectum* (L.) Hill, *Narthecium ossifragum* (L.) Huds., *Rhynchospora alba* (L.) Vahl., *Carex echinata* Murr. and *Kalmia polifolia* Wangenh.

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CHILWORTH, SURREY—31st July 1954.

Leader, Mr. S. WAKELY.

Although there was dry weather for this meeting, a cold wind was blowing, which no doubt accounted for the scarcity of insects noted. Proceeding south from the railway station, the party were soon on Black Heath, where a few *Eumenis semele* L. were seen. Imagines of the Pug *Eupithecia goossensiata* Mab. were common and in very fresh condition, but were loath to get on the wing. Two or three specimens of *Selidosema brunnearia* Vill. were taken after lunch. These were very fresh and it was felt that owing to the unseasonable weather conditions this species was not yet fully out.

During a short burst of sunshine several specimens of varieties of the showy cockchafer *Euchlora dubia* Scop. were netted as they flew around. This was undoubtedly the best record of the day, and a great surprise to the coleopterists present.

One microlepidopteron of special interest was taken, namely, the local *Mniophaga umbrosella* Zell., and a single specimen of *Salebria palumbella* Fab. was netted. This appeared to have just emerged—further evidence of the lateness of the season.

Coleoptera reported included the following:—*Calathus melanocephalus* L., *Anatis ocellata* L., *Myrrha 18-guttata* L., *Luperus longicornis* Fab. (*rufipes* Scop.), *Euchlora dubia* Scop. vars. *frischii* Fab. and *coerulescens* Schrib. and *Dalopius marginatus* L.

A special study of the Agromyzidae by a dipterist in the party brought to light the following species:—*Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Gareke), *P. labiatarum* Hd. (*Lamium album* L.), *Agromyza alnibetulae* Hd. (*Betula verrucosa* Ehrh.), *A. johannae* de Meij. (*Sarothamnus scoparius* (L.) Wimmer), *Liriomyza strigata* Mg. (*Senecio jacobaea* L.), *Napomyza xylostei* Kalt. (*Lonicera periclymenum*

L.), *Phytomyza pseudohellebori* Hd. (*Ranunculus bulbosus* L.), *P. sonchi* R.D. (*Hieracium* sp., *Taraxacum* sp., *Lapsana communis* L.), *P. spondylii* R.D. (*Heracleum sphondylium* L.), Empty mines were also taken of:—*Agromyza spiraeae* Kalt. (*Rubus idaeus* L.), *Liriomyza centaureae* H. (*Centaurea nigra* L.), *Phytagromyza hendeliana* Hg (*Lonicera periclymenum* L.), *Phytomyza albiceps* Mg. (*Artemisia vulgaris* L.), *P. anthrisci* Hd. (*Anthriscus sylvestris* (L.) Bernh.), *P. atricornis* Mg. (*Erigeron canadensis* L.), *P. lappina* Hd. (*Arctium* sp.), *P. periclymeni* de Meij. (*Lonicera periclymenum* L.), *P. ranunculivora* Hg. (*Ranunculus* sp.). 2 species new to the British List were taken, viz., *Phytomyza virgaureae* Hg., on *Solidago virga-aurea* L., and *P. hieracii* Hd. on *Hieracium* sp. (empty mines only).

It was decided to go to Womersley for tea and on the way larvae and pupae of the beetle *Cassida viridis* L. were found on a small clump of *Stachys sylvatica*. The leaves of the plants were riddled with the small holes made by the larvae when feeding.

A very nice tea was provided at The Shielings in the village.

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BOX HILL, SURREY—8th August 1954.

Leader, Mr. F. RUMSEY.

Owing to rain much of the time was spent under the dense shelter of the yew trees in Juniper Valley: less effective shelter would not suffice. When not raining it was dull.

The Lepidoptera noted included:—*Lygephila pastinum* Treits., *Sterrha dimidiata* Hufn., *S. trigeminata* Haw., *Hemistola immaculata* Thunbg. (*vernaria* Hb.), *Melanthia procellata* Schiff., *Ectropis bistorata* Goeze, *Aspitates gilvaria* Schiff., *Eumenis semele* L., *Polyommatus icarus* Rott., *Lysandra coridon* Poda, *Thymelicus sylvestris* Poda, *Crambus culmellus* L., *C. tristellus* Schiff., *Phlyctaenia crocealis* Hb., *Pyrausta nigrata* Scop., *P. purpuralis* L., and *Anania nubilalis* Hb.

Mr. G. C. D. Griffiths furnished the following list of Agromyzidae taken:—*Phytobia verbasci* Bouché (*Verbascum nigrum* L.), *Agromyza anthracina* Mg. (*Urtica dioica* L.), *A. reptans* Fall. (*Urtica dioica* L.), *Phytomyza affinis* Fall. (*Cirsium arvense* (L.) Scop.), *P. gentianae* Hd. (*Centaurea minus* Moench). Empty mines were also taken off:—*Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Garcke), *P. labiatarum* Hd. (*Lamium album* L.), *Agromyza nana* Mg. (*Trifolium* sp.), *A. rufipes* Mg. (*Echium vulgare* L.), *A. spiraeae* Kalt. (*Filipendula ulmaria* (L.) Maxim.), *Liriomyza centaureae* Hg. (*Centaurea nigra* L.), *L. strigata* Mg. (*Sonchus oleraceus* L.), *Phytagromyza hendeliana* Hg. (*Lonicera periclymenum* L.), *P. similis* Brischke (*Knautia arvensis* (L.) Coult.), *Napomyza glechomae* Kalt. (*Glechoma hederacea* L.), *Phytomyza agromyzina* Mg. (*Cornus sanguinea* L.), *P. atricornis* Mg. (*Sonchus*

spp.), *P. chaerophylli* Kalt. (*Chaerophyllum temulum* L.), *P. cirsii* Hd. (*Cirsium arvense* (L.) Scop.), *P. conyzae* Hd. (*Inula conyza* DC.), *P. ilicis* Curtis (*Ilex aquifolium* L.), *P. lappina* Hd. (*Arctium* sp.), *P. melana* Hd. (*Pimpinella saxifraga* L.), *P. obscura* Hd. (*Origanum vulgare* L.), *P. pastinacae* Hd. (*Pastinaca sativa* L.), *P. sonchi* R.D. (*Sonchus* spp., *Lapsana communis* L., *Taraxacum* sp.), *P. spondylii* R.D. (*Heracleum sphondylium* L.), *P. tordylii* Hd. (*Torilis japonica* (Houtt.) DC.), *P. vitalbae* Kalt. (*Clematis vitalba* L.). *Phytomyza campanulae* Hd., new to the British List was taken on *Campanula glomerata* L. *Cerodonta denticornis* Panz. was swept.

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EYNSFORD, KENT—14th August 1954.

Leader, Mr. C. H. HARDS.

The following Diptera (Agromyzidae) were noted:—*Phytobia iridis* Hd. (*Iris foetidissima* L.), *P. labiatarum* Hd. (*Stachys sylvatica* L., *Ajuga reptans* L.), *P. posticata* Mg. (*Solidago virga-aurea* L.), *P. pygmaea* Mg. (*Deschampsia caespitosa* (L.) Beauv.), *P. sönderupi* Hg. (*Carex* sp.), *P. verbasci* Bouché (*Verbascum thapsus* L.), *Ophiomyia maura* Mg. (*Solidago virga-aurea* L.), *Liriomyza pascuum* Mg. (*Euphorbia amygdaloides* L.), *Phytomyza affinis* Fall. (*Cirsium arvense* (L.) Scop.), *P. brunnipes* Brischke (*Sanicula europaea* L.), *P. gentianae* Hd. (*Centaurium minus* Moench), *P. ramosa* Hd. (*Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *P. solidaginis* Hd. (*Solidago virga-aurea* L.), *P. vitalbae* Kalt. (*Clematis vitalba* L.). Empty mines were also taken of: *Liriomyza amoena* Mg. (*Sambucus nigra* L.), *Phytogromyza similis* Brischke (*Knautia arvensis* (L.) Coult.), *P. agromyzina* Mg. (*Cornus sanguinea* L.), *P. atricornis* Mg. (*Erigeron canadensis* L.), *P. lappina* Hd. (*Arctium* sp.), *P. pastinacae* Hd. (*Pastinaca sativa* L.), *P. spondylii* R.D. (*Heracleum sphondylium* L.). *Liriomyza pusio* Mg., new to the British List, was taken on *Tragopogon pratensis* L. *Napomyza lateralis* Fall. was swept.

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SCRATCH WOOD, MIDDLESEX—22nd August 1954.

Leader, Mr. T. G. HOWARTH.

A total of eight members and two visitors attended this meeting, and they were exceedingly fortunate in having fine weather in this monsoon-like summer and but for a slight shower late in the afternoon the sun shone for most of the time.

About thirteen species of butterfly were seen, including a very worn specimen of *Argynnis cydippe* L., as well as the common Vanessids, Pierids and Hesperids which are about at this time of year.

The larvae of *Callimorpha jacobaeae* L. were abundant on Ragwort and specimens of the Antler moth, *Cerapteryx graminis* L. were dashing madly about over the low herbage in the sunshine and gave good exercise to those who wanted them. Larvae beating was tried by some members but was not very productive, a few common species only being found.

The party was entertained to tea by the leader and his wife at their home about half a mile away from the wood and by the kind help of Mr. Webb who ran a shuttle service with his car between the wood and the house members were saved a tiring uphill walk.

Afterwards the contents of an m.v. light trap was examined and a few specimens of various species of interest were found amongst the hundreds of *Triphaena pronuba* L. and *Apamea monoglypha* Hufn. Though so far as is known no rarities were taken, nevertheless members did not return absolutely empty handed after spending a pleasant day on the relatively unpopular side of London for our field meetings.

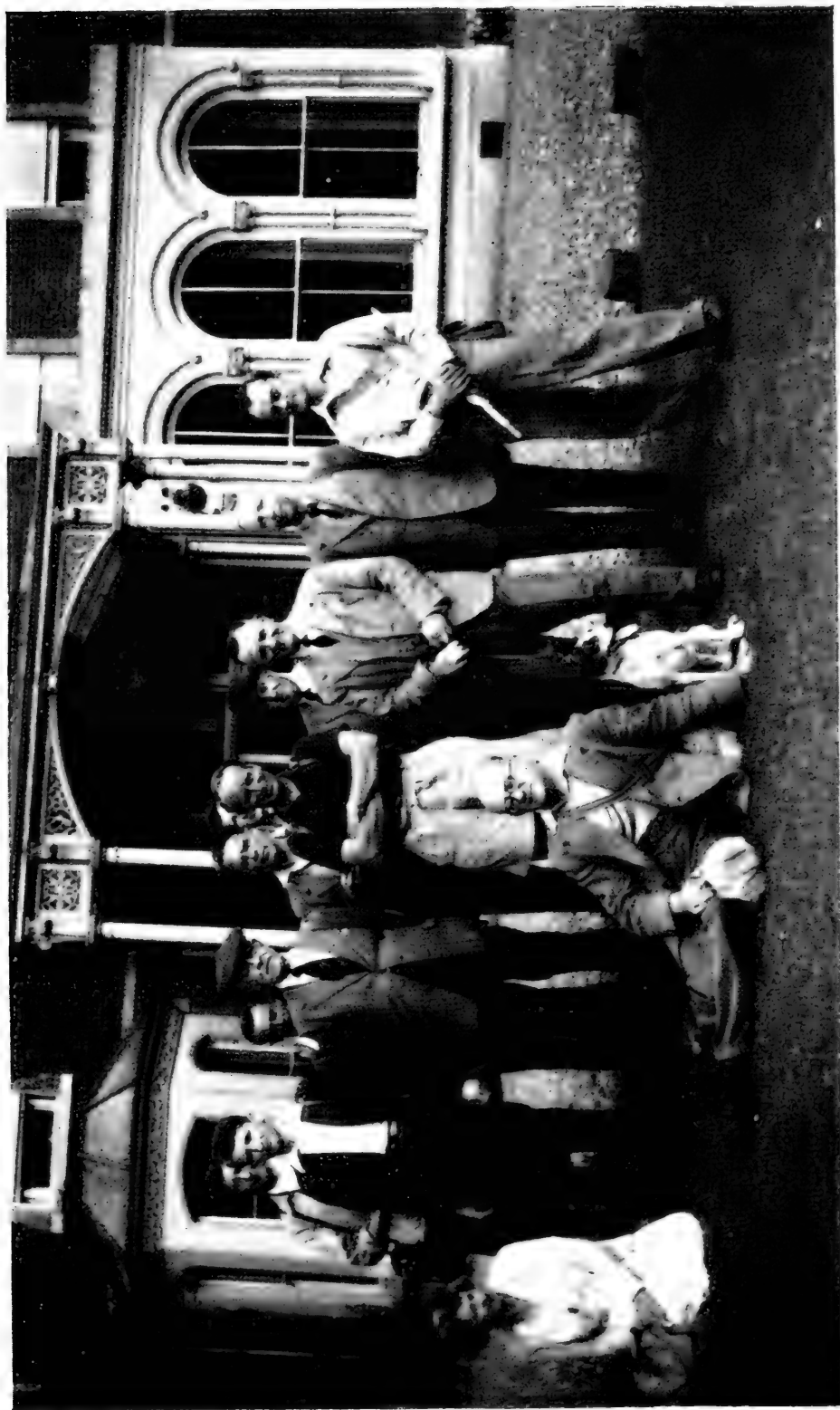
The following are lists of other species taken or noted:—  
LEPIDOPTERA—*Crambus pratellus* L., *C. culmellus* L., *Phlyctaenia lutealis* Hb., *Endotricha flammealis* Schiff., *Gelechia mulinella* Zell. DIPTERA (Agromyzidae)—*Phytobia labiatarum* Hd. (*Stachys sylvatica* L.), *P. sänderupi* Hg. (*Carex pendula* L., *Carex* spp.), *Agromyza genistae* Hd. (*Genista tinctoria* L.), *A. spiraeae* Kalt. (*Agrimonia eupatoria* L., *Potentilla reptans* L.), *Liriomyza centaureae* Hg. (*Centaurea nigra* L.), *L. pusio* Mg. (*Tragopogon pratensis* L.), *Napomyza xylostei* Kalt. (*Lonicera periclymenum* L.), *Phytomyza angelicae* Kalt. (*Angelica sylvestris* L.), *P. melana* Hd. (*Pimpinella saxifraga* L.). Empty mines were also taken of: *Agromyza johannae* de Meij. (*Sarothamnus scoparius* (L.) Wimmer), *Phytomyza periclymeni* de Meij. (*Lonicera periclymenum* L.).

#### MICKLEHAM, SURREY—29th August 1954.

Leader, Mr. F. T. VALLINS.

The day was bright and sunny when the party of eight left Boxhill Station and made its way by road to Juniper Hall. By previous arrangement, the party was here joined by eight of the students from the Field Centre, headed by Mr. John Sankey, the Assistant Warden, and continued its way along Headley Lane for about a mile. A path was then followed to the top of Mickleham Down. The sky had by this time clouded over, and remained thus for the rest of the day. The centre of operations was the famous "Hilly Field", but all forms of insect life were scarce. Sweeping the herbage and beating the foliage of trees and bushes were equally unproductive. A colony of the "trap-door" spider (*Atypus affinis* Eichw.) was found, and two specimens were dug out for inspection. Also found were the beetle, *Chrysolina staphylaea* L., the bug, *Zicrona caerulea* L., and the Dipteron, *Volucella inanis* L.

The following micro-lepidoptera were found:—*Salebria semirubella* Scop. A few moths were netted. *Oidaematophorus carphodactylus* Hb. Larvae were not uncommon in flower-heads and crowns of young plants of *Inula conyzia* DC. (Ploughman's Spikenard). *Phalonia gilvicomana* Zell. A few larvae were found among flowers and seeds of *Myccelis muralis* (L.) (Wall Lettuce). In a normal season, the larvae are fully fed in the last week in July, so they were exceptionally late this year. *Lithocolletis scabiosella* Dougl. Larval mines of this local species were found in leaves of *Scabiosa columbaria* L. (Small Scabious), at "Hilly Field". This is believed to be the first record for this locality.



Mickleham (Juniper Hall), Surrey (29th August 1954).

The party included several visitors staying at Juniper Hall. J. H. P. Sankey (Assistant Warden) is in centre with arms folded. South London members present are: G. C. D. Griffiths, M. Niblett, F. T. Vallins, Sir Leonard Wakely, S. Wakely, Dr D. A. B. Macnicol, Dr. B. P. Moore.



It was noticed that not a solitary beech-nut could be found on any of the many beech trees growing on the top of Mickleham Down, and the fate of the Tortrix moths, which normally feed on the fruits, was a subject of speculation.

By the courtesy of Mr. and Mrs. Sankey, a most enjoyable tea was taken at Juniper Hall, after which the party adjourned to see the two tame badgers, which were almost household pets. One was particularly tame, and its obvious appreciation of Mr. Sankey's attentions caused much amusement.

The party made its way to the station by way of the fields, after a most pleasant, if rather unproductive, day.

The following Agromyzid mines were found:—*Agromyza spiraeae* Kalt. (*Potentilla reptans* L.), *Phytomyza plantaginicaulis* Hg. (*Plantago lanceolata* L.), *P. ramosa* Hd. (*Dipsacus fullonum* L. s.sp. *Sylvestris* (Huds.) Clapham), *P. scabiosae* Hd. (*Scabiosa columbaria* L.), *P. scolopendrii* R.D. (*Asplenium ruta-muraria* L.), Empty mines were also taken of: *Phytobia verbasci* Bouché (*Scrophularia nodosa* L.), *P. labiatarum* Hd. (*Ajuga reptans* L.), *Liriomyza strigata* Mg. (*Senecio jacobaea* L.), *Phytomyza similis* Brischke (*Knautia arvensis* (L.) Coult.), *Phytomyza agromyzina* Mg. (*Cornus sanguinea* L.), *P. brunnipes* Brischke (*Sanicula europaea* L.), *P. campanulae* Hd. (*Campanula glomerata* L.), *P. conyzae* Hd. (*Inula conyza* DC.), *P. gentianae* Hd. (*Centaureum minus* Moench.), *P. lappina* Hd. (*Arctium* sp.), *P. obscura* Hd. (*Origanum vulgare* L.), *P. ranunculi* Schrank (*Ranunculus* sp.), *P. vitalbae* Kalt. (*Clematis vitalba* L.).

The plant galls seen were:—HYMENOPTERA (Cynipidae)—*Neuroterus baccarum* L., f. *lenticularis* Oliv., *N. albipes* Schk., f. *laeviusculus* Schk., *Andricus ostreus* Gir., *Rhodites dispar* Niblett, *R. roseae* L., *R. spinosissimae* Gir. DIPTERA (Cecidomyiidae)—*Anisostephus betulinum* Kieff., *Craneiobia corni* Gir., *Dasyneura crataegi* Winn., *Hartigiola annulipes* Htg., *Jaapiella veronicae* Val., *Massalongia rubra* Kieff., *Taxomyia taxi* Inch., *Wachtliella rosarum* Hardy. HEMIPTERA (Psyllidae)—*Trichochermes walkeri* Forst., *Psylla buxi* L. ARACHNIDA (Eriophyidae)—*Eriophyes macrorrhynchus* Nal., *E. oringani* Nal.

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RIDDLESDOWN, SURREY—4th September 1954.

Leader, Mr. S. WAKELY.

The heavy rain which was falling no doubt accounted for the very poor attendance at this fixture. One member (with his wife), met the Leader at Purley, and in spite of the wet it was decided to try the junipers on Riddlesdown for larvae of *Thera juniperata* L. As usual, these larva were not uncommon—mostly full fed. A few larvae of *Gonodontis bidentata* Clerck were also beaten from the junipers. A fat lizard fell on the beating tray from one of the junipers—probably no less surprised than we were to see it. Two Hemiptera were also dislodged, namely: *Picromerus bidens* L. and *Nabis apterus* F. Larvae of *Leucoptera scitella* Zell. were found in the leaves of hawthorn. After



lunch, with the rain still falling, it was decided to return home. The Leader reported that as soon as he was in the train and homeward bound the weather improved, and by the time he reached home there was brilliant sunshine, followed by a fine evening!

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BOX HILL, SURREY—12th September 1954.

Leader, Mr. G. C. D. GRIFFITHS.

A party of 5 members and 1 visitor assembled at Box Hill Station at 10.50 a.m. The area of the river was first worked, but during the latter part of the morning the party moved to the south slope of Box Hill. Here lunch was had and after it the party worked the woods at the top of Box Hill, moving towards Juniper Valley, which was reached late in the afternoon. The party then returned via Headley Lane and had a very enjoyable tea at the "Stepping Stones" (formerly "The Railway Arms").

The weather was fine in the morning, though the herbage was rather wet which made beating and sweeping difficult. A shower after lunch put an end to all hopes of larva beating, and rendered Mr. Leston's efforts at sweeping for Hemiptera somewhat unrewarding, the only species of note taken being *Blepharidopterus angulatus* Fall. f. *brevicornis* Wagner—a form not previously recorded from Britain. It was beaten from Alder.

The lepidopterists took *Lysandra bellargus* Rott. and *Hesperia comma* L. on the south slope of Box Hill, while larvae of *Lithocolletis scabiosella* Dougl. were found on *Scabiosa columbaria* L. Mr. Wakely also took interesting larvae on *Circaea lutetiana* L.

The following Agromyzid mines were obtained:—*Phytobia verbasci* Bouche (*Verbascum thapsus* L.), *Liriomyza strigata* Mg. (*Centaurea nigra* L.), *Phytomyza conyzae* Hd. (*Inula-conyza* DC.), *P. ramosa* Hd. (*Knautia arvensis* (L.) Coult.), *P. ranunculivora* Hg. (*Ranunculus* sp.), *P. scolopendrii* R.D. (*Asplenium ruta-muraria* L.), *P. sonchi* R.D. (*Taraxacum* ssp.), *P. tussilaginis* Hd. (*Petasites hybridus* (L.) Gaertn., Ney. & Scherb.), *P. vitalbae* Kalt. (*Clematis vitalba* L.). Empty mines were also taken of:—*Agromyza albipennis* Mg. (*Phragmites communis* Trin.), *Phytagromyza populi* Kalt. (*Populus nigra* L.), *P. similis* Brischke (*Knautia arvensis* (L.) Coult.), *Phytomyza agromyzina* Mg. (*Cornus sanguinea* L.), *P. pseudohellebori* Hd. (*Ranunculus* sp.), *P. scabiosae* Hd. (*Scabiosa columbaria* L.). Empty mines of *Phytagromyza langei* Hg., new to the British List, were taken on *Salix* sp. (? *caprea* L.). The following were swept:—*Cerodonta fulvipes* Mg., *Phytomyza ranunculi* Schrank.

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WESTERHAM, KENT—19th September 1954.

Leader, Mr. S. N. A. Jacobs.

Attendance was poor at this meeting, probably due to the unpromising meteorological conditions. However, the weather remained fine,

and those present were able to crowd into the leader's car. A small wood just south of Limpsfield Chart was first visited, and a single *Acleris cristana* Schiff. was netted after a lot of beating in the thickets. A larva of *Eupithecia castigata* Hb. was found on *Galeopsis tetrahit*. An interesting find was the remains of a bumble bee's nest on the ground. A few bees were still present among the debris, and a number of dipterous larvae were also found and taken home to find out the species by rearing. It was thought the comb had been eaten by a badger the previous night.

After lunch a visit was paid to Limpsfield Chart. Beetles taken at the base of rotting *Boletus* sp. included *Necrophorus vespilloides* Hbst. and *Ontholestes tessellatus* Gf.

Larvae of the dipteran *Noëta pupillata* Fal. were very common in swollen heads of a species of *Hieracium*. Several other species of diptera were noted by Mr. G. C. D. Griffiths who supplied the following list:—*Agromyza nana* Mg. (*Trifolium* sp.), *Ophiomyia maura* Mg. (*Solidago virgaurea* L.), *Liriomyza flaveola* Fall. (*Holcus lanatus* L.), *Phytomyza langei* Hg. (*Salix* sp. ? *caprea* L.), *P. tremulae* Hg. (*Populus tremula* L.), *Napomyza xylostei* Kalt. (*Lonicera periclymenum* L.), *Phytomyza melana* Hd. (*Pimpinella saxifraga* L.), *P. pseudohellebori* Hd. (*Ranunculus* sp.), *P. ranunculi* Schrank (*Ranunculus* sp.), *P. solidaginis* Hd. (*Solidago virgaurea* L.). Empty mines were also taken off:—*Phytobia posticata* Mg. (*Solidago virgaurea* L.), *Agromyza alnibetulae* Mg. (*Betula verrucosa* Ehrh.), *Liriomyza centaureae* Hg. (*Centaurea nigra* L.), *L. strigata* Mg. (*Senecio jacobaea* L.), *Phytomyza affinis* Fall. (*Cirsium arvense* (L.) Scop.), *P. gentianae* Hd. (*Centaurea minus* Moench), *P. ilicis* Curtis (*Ilex aquifolium* L.), *P. lappina* Hd. (*Arctium* sp.), *P. sonchi* R.D. (*Lapsana communis* L.).

*Phytomyza cecidonomia* Hg., new to Britain, was bred from *Hypochaeris radicata* L.

The Trypetid *Spilographa spinifrons* Schroeder was bred from *Solidago virgaurea* L.

A pleasant tea was enjoyed at Pitt's Cottage, Westerham.

## SHEEPLEAS, EAST HORSLEY, SURREY—25th September 1954.

Leader, Mr. T. R. EAGLES.

It was a dull day but there was no rain and the foliage was dry. The season had been so bad that this was considered very fortunate.

Soon after leaving the station it was noticed that the larvae of *Peronea boscana* F. had been feeding in abundance on the elms. Most of the larvae had pupated and emerged but there were a few left. On small birches the larvae of *Hadena contigua* Schiff. were found on the lower parts of the bushes. Other larvae noted were those of *Dasychira pudibunda* L., *Cosymbia linearia* Hb., *Horisme vitalbata* Schiff. and *Notodonta dromedarius* L.

In the fields on the way to Sheepleas an abundant growth of *Kickxia spuria* (L.) Dum. and *K. elatine* (L.) Dum. was in full bloom.

Owing to the wet season fungi were plentiful, the most notable being *Armillaria mucida* (Schröd.) Fr., *Mycaena pura* (Pers.) Fr., *Crepidotus mollis* (Schaeff.) Fr., *Coprinus picaceus* (Bull.) Fr., *Polyporus picipes* (Fr.) Pers., *Clavaria pistillaris* (L.) Fr. and *Geaster triplex* Jungh.

#### MICKLEHAM DOWNS FUNGUS FORAY—17th October 1954.

Leader, Mr. W. H. SPREADBURY.

Twenty-one members and their friends enjoyed a fine day on this occasion.

Fungi were not very numerous and were generally in poor condition, but 60 species were noted, including *Geaster triplex*, *Mutinus caninus*, *Xylaria polymorpha*, *Schizophyllum commune* and the evil-smelling *Marasmius foetidus*.

The entomologists did not neglect their opportunities.

Larvae of *Coleophora erigerella* Ford were found on *Erigeron acris* L., *Gracillaria auroguttella* Steph. and *Nepticula septembrella* Staint. on *Hypericum* sp. and *Nepticula poterii* Staint. on *Poterium sanguisorba* L. From the yews larvae of *Atolmis rubricollis* L. and *Laspeyria flexula* Schiff. were beaten. A full-fed larva of *Stauropus fagi* L. was found on beech. Imagines of *Oporinia dilutata* Schiff. were seen.

A few plants were still in good flower and *Campanula glomerata* L., *C. rotundifolia* L., *Inula conyza* DC., *Clinopodium vulgare* L. and *Erigeron acris* L. were noteworthy.

Fruit on Spindle and Dogwood was far below average and no Beech mast could be found at all.

Tea was taken at the Stepping Stones (formerly Railway Arms) in Westhumble Street.

The leader's list of fungi and Mr. G. C. D. Griffith's list of dipterous leaf-miners are appended.

#### FUNGI.

*Lepiota cristata* (A. & S.) Fr., *Tricholoma sulphureum* (Bull.) Fr., *T. fulvum* Fr. = *flavo-brunneum* Fr., *T. rutilans* (Schaeff.) Fr., *T. terreum* Fr., *T. nudum* Fr. (one very small specimen), *Clitocybe nebularis* (Batsch) Fr. (abundant), *C. odora* (Bull.) Fr. (one only), *C. tuba* Fr., *C. phyllophila* Fr., *Laccaria amethystina* (Vaill.) Cke., *Mycena pura* (Pers.) Fr. and var. *rosea* Schum., *M. galericulata* (Scop.) Fr., *M. inclinata* Fr., *M. lactea* (Pers.) Fr., *M. filipes* (Bull.) Fr., *Collybia radicata* (Rebel) Berk., *Marasmius personatus* (Bolt.) Fr., *M. acervatus* (Fr.) comb. nov., *M. confluens* (Pers.) Karst., *M. foetidus* (Sow.) Fr., *M. Wynnei* B. & Br., *Schizophyllum commune* Fr., *Hygrophorus eburneus* (Bull.) Fr., *Lactarius torminosus* Fr., *L. blennius* Fr., *L. glyciosmus* Fr., *L. mitissimus* Fr., *Russula Mairei* Singer (beechwood form of *R. emetica* (Schaeff.) Fr.), *R. ochroleuca* Fr., *Pluteus cervinus* (Schaeff.) Fr., *Pholiota mutabilis* (Schaeff.) Fr., *Hebeloma fastibile* (Pers.) Fr., *H. crustuliniforme* (Bull.) Fr., *Flammula sapinea* Fr., *Galera hypnorum* (Batsch) Fr., *Cortinarius largus* Fr., *Crepidotus*

*mollis* (Schaeff.) Fr., *Inocybe geophylla* (Sow.) Fr., *Paxillus atrotomentosus* (Batsch) Fr., *Stropharia aeruginosa* (Curtis) Fr., *S. inuncta* Fr., *Hypholoma fasciculare* (Huds.) Fr., *Psathyrella conopilea* Fr., *Panaeolus* sp., *Psalliota silvicola* (Vitt.) Sacc., *P. silvatica* (Schaeff.) Fr., *Coprinus picaceus* (Bull.) Fr. (fairly common), *C. plicatilis* (Curt.) Fr., *Polyporus betulinus* (Bull.) Fr., *P. squamosus* (Huds.) Fr., *Polystictus versicolor* (L.) Fr., *Poria vaporaria* (Pers.) Fr., *Mutinus caninus* (Huds.) Fr., *Lycoperdon perlatum* Pers., *Geaster triplex* Jungh., *Xylaria hypoxylon* Grev., *X. polymorpha* Grev., *Trichoscypha calycina* (Schum. ex Fr.) Boud., *Helvella crispa* Scop. ex Fr.

#### MYCETOZOA.

*Dictydiaethalium plumbeum* Rost.

#### DIPTERA.

*Agromyza reptans* Fall. (*Urtica dioica* L.), *A. spiraeae* Kalt. (*Fragaria vesca* L., *Poterium sanguisorba* L., *Sanguisorba officinalis* L., *Potentilla reptans* L.), *Liriomyza strigata* Mg. (*Senecio jacobaea* L.), *Napomyza glechomae* Kalt. (*Glechoma hederacea* L.), *Phytomyza conyzae* Hd. (*Inula conyza* DC.), *P. crassiseta* Zett. (*Veronica* sp.), *P. fulgens* Hd. (*Clematis vitalba* L.), *P. pastinacae* Hd. (*Pastinaca sativa* L.), *P. scabiosae* Hd. (*Scabiosa columbaria* L.). Empty mines were also taken of: *Phytobia labiatarum* Hd. (*Stachys sylvatica* L.), *P. verbasci* Bouché (*Verbascum thapsus* L., *Scrophularia nodosa* L.), *Phytomyza agromyzina* Mg. (*Cornus sanguinea* L.), *P. brunnipes* Brischke (*Sanicula europaea* L.), *P. campanulae* Hd. (*Campanula glomerata* L.), *P. cirsii* Hd. (*Cirsium arvense* (L.) Scop.), *P. ilicis* Curtis (*Ilex aquifolium* L.), *P. vitalbae* Kalt. (*Clematis vitalba* L.).

## TRANSACTIONS

## THE BRITISH AGROMYZIDAE (DIPT.).

By K. A. SPENCER, B.A., F.R.E.S.

Read 24th February 1954.

## I. GENERAL.

The Agromyzidae are primarily known as a family of leaf miners; that is to say the larvae eat out channels or blotches in the leaves of their host plants. However, there is scarcely any part of the plant in which one or other species of Agromyzid does not live. For instance, *Napomyza annulipes* (Mg.) forms root galls on *Artemisia campestris* L.; there are many internal stem-feeders, such as *Melanagromyza dettmeri* Hg. in *Centaurea* spp. and *Phytomyza flavicornis* Fall. in *Urtica* spp.; *Phytomyza varipes* Mcq. feeds in flower-heads of *Rhinanthus major* Ehrh.; *Melanagromyza simplicoides* Hd. forms galls on the twigs of *Salix* spp.; and I have just discovered a new species, *Phytomyza vulnerariae* sp. nov. (in litt.) forming mines in the bracts of *Anthyllis vulneraria* L. It is certain that many new, non-leaf mining species remain to be discovered. However, the great knowledge we have of this family has been in large measure due to the careful breeding of the flies from their leaf mines and to the very thorough study of the leaf mines themselves, which have been carried out over the past 30 years by Prof. E. M. Hering in Berlin.

The diagnostic characters of leaf mines have been very fully described in English translation by Hering (1951). The particular significance of leaf mines derives from the fact that species which are morphologically so similar that they can be separated only with the greatest difficulty can very frequently be identified quickly and accurately from a study of the characteristics of their leaf mine. This applies particularly to the large homogeneous genera *Liriomyza* and *Phytomyza*, where individual specimens of many species cannot be satisfactorily determined from Hendel's Key (1936).

In general the Agromyzidae are extremely selective in their host-plants; the great majority are limited to a single species or genus of plant, or in a number of cases to a family. The truly polyphagous species, such as *Phytomyza atricornis* Mg. or *Liriomyza strigata* (Mg.) are very few. Recent work is showing, however, that species which were thought to be limited to a single host or a single genus do in fact have a very much wider host range. For example, *Phytomyza spondylii* R.-D. was thought to be confined to the genus *Heracleum*; but I have found it on *Astrantia* and Hering has found it also on *Levisticum* and other genera. This therefore leads to a word of warning: the discovery of a fly on a hitherto unrecorded host-plant can no longer be taken as a reliable indication that a new species is involved. A striking example of this is provided by *Phytobia iridis* (Hd.). This has always been

considered to be strictly monophagous on *Iris foetidissima* L. When leaf-miners were reported recently causing damage on *Iris ochroleuca* L. in a nursery at Enfield, Middx., it was considered a priori that *P. iridis* (Hd.) could be excluded. Careful examination, however, has shown that this was the species concerned.

Many species of Agromyzidae have been described from single bred or caught specimens. There are many other well-known species, such as *Phytomyza robustella* Hd., *P. nigripennis* Zett., *Metopomyza atro-nitens* (Hd.), which frequently appear in the sweep-net but which have never been bred and whose biology thus remains unknown. Systematic collection of leaf mines and careful breeding of the flies will certainly enable many gaps in our knowledge to be filled and this represents an exciting and rewarding field for the serious amateur entomologist. At the same time this work can materially assist the more specialised studies of the professional systematist.

It is a relatively simple matter to breed Agromyzidae once leaf mines containing larvae have been found but it may be useful to refer here briefly to a number of points which may help in obtaining successful results. The first essential is to ensure that the mines collected retain their turgidity sufficiently long to enable the larva to complete its development. When found the mines should be placed immediately in an air-tight tin. Flat cigarette tins are light and very suitable for this purpose. As soon as possible, however, the mines should be transferred to corked tubes or screw-top jars, where they can be observed. Mines in very young leaves and on certain thin-leaved species, such as *Sonchus* and *Impatiens*, should be placed immediately in tubes or jars in the field, as in such cases the slightest loss of moisture will result in the larvae being found dead on arrival home. When the larvae are seen to have pupated, the puparia should be transferred to smaller labelled tubes to await the emergence of the flies. The mines themselves should be pressed and filed for future study and reference. In cases where the puparia remain in the leaf they should be carefully removed, as if they are allowed to remain in the leaf, mould will rapidly set in and most, if not all, will die. Species with a short pupal period of 10 days to 3 weeks need no special attention and subject to normal mortality and parasitism, emerge without difficulty. Species which pass some months in the summer or the entire winter as puparia represent a much more serious problem. Desiccation must be prevented at all costs, while on the other hand excessive dampness may lead to the development of mould, which arises initially on dead specimens but if allowed to spread may quickly kill all others in the same tube. Adequate moisture can be maintained in the breeding tubes by adding damp moss or sand, or by periodic damping which is the method I favour; every worker will probably develop his own particular method of dealing with this problem. Beginners should not feel discouraged if only few flies appear after the winter, as whatever conditions dipterous puparia are kept in, the mortality rate appears to remain distressingly high. Forcing at warm room temperature is moderately successful provided the

puparia have previously undergone a period of natural or artificial freezing.

The range of variation of individual species is a problem on which virtually no work has been done. In most cases insufficient bred material is available on which such investigations could be based. Many species, however, have been set up on the basis of minute morphological differences with no final certainty with regard to their constancy. It is in such cases that the biological approach to the Agromyzidae which has been employed so brilliantly by Hering and which has resulted in the discovery of so many new species could well be carried a stage further. Hering has in the main limited his biological work simply to breeding out the flies from the larval mines. Confirmatory biological work could now usefully be undertaken, for instance, on such pairs of species as *Phytomyza spondylii* R.-D. (*Heracleum*) and *P. pastinacae* Hd. (*Pastinaca*); *Phytomyza conopodii* Hg. (*Conopodium*) and *P. carvi* Hg. (*Carum*); and *Phytomyza anthrisci* Hd. (*Anthriscus*) and *P. tardylus* Hd. (*Torilis*). Will individuals bred from differing host-plants mate? Can females bred from the one host successfully oviposit on the other? How will the females react when given a choice of host plants? Work on these lines has provided most successful results with the Cecidomyiidae and has been admirably summarised by Barnes (1953).

Further study is also required on both the larvae and also the genitalia of the adults. De Meijere (1925 et seq.) carried out numerous studies of Agromyzid larvae and this work is being continued by Hering (1954). These studies, however, are far from complete and in any case virtually no larval or genitalia slides exist in this country.

These brief remarks will have indicated some of the lines of work which require to be followed with regard to the Agromyzidae in Britain.

## II. ADDITIONS TO AND DELETIONS FROM THE BRITISH LIST.

*Agromyza igniceps* Hd. New to Britain. I found mines containing larvae at Luccombe, I. of W., on *Humulus lupulus* L. on 19th June 1955 and empty mines near Maidstone, Kent, some days later. The other, commoner species feeding on hops, *A. flaviceps* Hd. has been known in this country for some time but from the above two records it seems possible that *igniceps* Hd. is also widely distributed with its food-plant. The larval mines of this species have the frass arranged in conspicuous, black, elongate strips and it is thus readily distinguishable from *flaviceps* Hd. where the frass is diffuse and greenish.

*A. niveipennis* Zett. New to Britain. An empty mine has previously been referred to this species (Parmenter, 1954). The species can now be confirmed as British from a specimen I have examined in the Bristol University collection taken by Audcent in the "Thames marshes", 3rd August 1915. Mr. J. E. Collin has also taken the species.

*Phytobia (Dizygomyza) bimaculata* (Mg.). New to Britain. I swept a specimen at Colley Hill, Surrey, on 29th May 1955. The species has a characteristic shiny black thorax, making it easily distinguishable from its near relatives. The host-plant is *Luzula pilosa* L. Widespread in Europe.



*P. (Poëmyza) scutellaris* (v. Ros.). New to Britain. I discovered a single specimen in Mr. E. A. Fonseca's collection taken at Coombe Dingle, near Bristol, Som., on 30th April 1950. The host-plant is *Scirpus sylvaticus* L. and the species is known to occur locally in Scandinavia and Germany.

*P. (Amauromyza) morionella* (Zett.). New to Britain. I have bred this species from leaf-mines on *Marrubium vulgare* L. kindly presented to me by Mr. S. Wakely, obtained at the Needles, I. of W., on 10th August 1954. Some flies emerged in early September and 2 others in April and May 1955. The species is one of the commonest in the Mediterranean area and its occurrence in the Isle of Wight is therefore interesting. It has been found on many genera of the Labiatae.

*Liriomyza brassicae* (Ril.) (= *cruciferarum* Hg.). New to Britain. 2 mines containing larvae were found near Kings Langley, Bucks., on 3rd July 1954, on *Armoracia rusticana* Gaert., Mey. & Sherb. The species occurs widely throughout the Palaearctic region and has been found on many genera of the Cruciferae.

*L. pusio* (Mg.). New to Britain. Confirmed records of this species have now been obtained by Mr. G. C. D. Griffiths, who has bred the adult from mines found on *Tragopogon pratensis* L. at Eynsford, Kent, on 14th August 1954; the mines also occur commonly at Scratch Wood, Middx.

*Phytagromyza anteposita* (Str.). New to Britain. 4 specimens swept by Griffiths at Darenth, Kent, on 9th May 1954. Host-plant is unknown but taken widely in Central Europe.

*P. langei* Hg. Not recorded in Britain. Empty mines found by Griffiths on *Salix caprea* L. at Boxhill, Surrey, on 12th September 1954.

*P. discrepans* (Wulp). New to Britain. I took a single specimen in the River Wey marshes, near Godalming, Surrey, at a Field Meeting of this Society on 11th June 1955. I have examined the specimens determined as this species which were taken by Audcent and published by Parmenter (1953) and found the identifications to be inaccurate; the species concerned were *P. orphana* Hd. (2) and *P. anteposita* (Str.). The species is widely distributed in Europe but the host-plant is not known.

*P. spinicauda* Hd. New to Britain. I swept a specimen on Hampstead Heath, London, 10th June 1954. Reported only from Germany, Austria. Not common, host-plant unknown. The specimen published by Parmenter (1953), taken by Audcent proved on examination to be *P. orphana* Hd.

*P. tristriata* Hd. New to Britain. I noted a specimen in Mr. Fonseca's collection taken at Blaise Woods, near Bristol, Glos., on 14th October 1946. This is not a common species and Hendel had only seen 2 specimens, from Germany and Austria. Host-plant unknown.

*Phytomyza adjuncta* Hg. Griffiths has brought to my attention the occurrence of this species on *Pimpinella major* L. at Mill Hill, Middx. Comparison of these specimens with those bred from *P. saxifraga* L. at Egham, Surrey (Spencer, 1953) shows that the latter are in fact



*melana* Hd. and not *adjuncta* Hg. as published. The characters hitherto used in separating these 2 species appear not to be entirely constant and it is thus clearly desirable to obtain further bred material from both plants.

*P. alpina* Groschke (in litt.). New to Britain. Bred by Prof. O. W. Richards from mines found on 10th July 1953, on *Senecio jacobaeae* L. at Kinlochewe, Ross.

*P. bellidina* Hg. New to Britain. A single specimen swept at Hampstead on 24th June 1954 can be referred to this species. The species was originally described from Italy and subsequent records have all been from the Mediterranean area. The Hampstead specimen is strikingly lighter in colour than specimens I have bred from Portugal and Spain from leaf-mines on *Bellis sylvestris* (L.) Cyr. and I consider it possible that it may prove to be a new species. Bred material will be necessary, however, before a decision can be reached on this point.

*P. cana* Rydén (in litt.). New to Britain. A single specimen (det. Hering) taken on 11th July 1954 at Faversham, Kent, at a Field Meeting of this Society.

*P. corvimontana* Hd. New to Britain. Bred by Griffiths from mines found on 2nd October 1954 on *Achillea ptarmica* L. at Scratch Wood, Middx.; one fly emerged, 25th October 1954.

*P. fallaciosa* Bri. New to Britain. Bred from blotch mines on *Ranunculus repens* L., Scratch Wood, October 1954. This species pupates in the mine and the black puparium has two characteristic spine-like posterior spiracular processes which penetrate through the leaf. It is a common species which has been overlooked in this country.

*P. nigricoxa* Hd. New to Britain. A single specimen swept by Griffiths at Darenth, Kent, on 9th May 1954. This is a characteristic species, living in the seeds of *Anemone* spp. Recorded from Germany and Denmark.

*P. plantaginicaulis* Hg. New to Britain. In the few existing British records this species has been confounded with *plantaginis* R.-D. The only consistent morphological difference between the two species found by Hendel was that *plantaginicaulis* Hg. has a single bristle on the 1st antennal segment, while *plantaginis* R.-D. has a group; he also noted that the former species was smaller. Hering (1936) considered that *plantaginicaulis* Hg. was confined to *Plantago lanceolata* L. as host-plant, while *plantaginis* R.-D. lived on the broad-leaved species like *P. major* L. De Meijere (1944) noted differences in the larvae obtained from the different food-plants.

I have recently bred specimens referable to both species. *Foodplant*: In September 1954 I found mines on both *P. lanceolata* L. and *major* L. growing together at Hope, S. Devon. 4 specimens bred from *P. major* L. are all referable to *plantaginis* R.-D.; 3 specimens from *P. lanceolata* to *plantaginicaulis* Hg. However, one specimen *P. lanceolata* L. is without doubt *plantaginis* R.-D. A specimen bred from *P. major*, found at Trescoe, Scilly Isles and kindly presented to me by Mr. Ralph Tubbs, is *plantaginis* R.-D., and specimens bred

from *P. lanceolata* L. at Ash Vale, Surrey, and Slough, Bucks., are *plantaginicaulis* Hg. Two specimens swept on *P. maritima* L. at Faversham, Kent, are *plantaginicaulis* Hg. This evidence confirms that *plantaginis* R.-D. normally feeds on *P. major* and *plantaginicaulis* Hg. on the narrow-leaved species; it shows, however, that a transference is possible, at least when the different hosts are growing in proximity.

*Size*—Average wing measurements are: *P. plantaginis* R.-D. (5 specimens), 2.29 mm.; *P. plantaginicaulis* Hg. (9 specimens), 1.96 mm. The wing length of the specimens of *plantaginis* R.-D. bred from *P. lanceolata* was 2.43 mm.

*Antennae*—It is slightly misleading when Hendel claims that *P. plantaginicaulis* Hg. has only a single bristle on the 1st antennal segment; in fact here are frequently 2 bristles. It is true, however, as he correctly noted that in *plantaginis* R.-D. there is a bunch of such bristles.

*P. taraxaci* Hd. New to Britain. A single specimen (det. Hering) taken at Chippenham Fen, Cambs., on 8th July 1954. The species was described from specimens bred from lower surface linear mines on *Taraxacum* sp. in Northern Germany. Confirmation of this record from bred material is desirable.

*P. tordylii* Hd. New to Britain. Bred by Pamela Allen from mines on *Torilis japonica* (Houtt.) DC. found in July 1953 near Silwood Park, Surrey. This species is believed to be monophagous on *Torilis* but further work is required to confirm its biology.

*P. virgaureae* Hd. New to Britain. A single specimen bred by Griffiths from *Solidago virgaurea* L. at Chilworth, Surrey, on 14th August 1954. The leaf mine of this species can be distinguished without difficulty from that of *P. solidaginis* Hd., which is very common on the same food-plant; it is substantially longer and the frass is deposited in separate grains, not in threads or long strings of grains. Widely distributed in Europe.

The following species should be deleted from the British list:

*Liriomyza violae* (Curt.). There are no extant specimens of the species described by Curtis over 100 years ago and the description is too general to permit identification of a species of this genus; the species should therefore be sunk. The specimens observed by Curtis were very probably *L. strigata* (Mg.).

*Phytomyza trivittata* (Lw.). This was a doubtful identification in the first place (Parmenter, 1949) and there is now no trace of the specimen concerned in Hamm's collection.

*Napomyza nigricans* (Macq.). This species is included in Kloet & Hincks (1945) but I have not been able to trace any specimens so determined. Hendel (1936, p. 318) considered it in any case to be a doubtful species.

*P. fuscula* Zett. I have carefully examined specimens so determined and they all proved to be *nigra* Mg. The two species are very similar

but in *fuscula* Zett. the eyes are very much more sparsely haired. I am indebted to Mr. J. E. Collin for kindly allowing me to examine these specimens.

### III. AN INTERIM LIST OF BRITISH SPECIES.

Some intensive work has been done on the Agromyzidae in this country during the past few years and numerous additions have been made to the British list, including several species new to science. The Check list published 10 years ago (Kloet & Hincks, 1945) included 90 British species; at the present time this number has been almost trebled, either as perfect insects, or on the basis of empty mines. These new records have appeared in a variety of publications and the author feels that a new interim list will prove of considerable value to workers on the family. An attempt has been made not only to collate existing records but also to evaluate them. Unfortunately, however, lack of time has made it impossible to complete the critical examination of all the collections of Agromyzidae in the country. In addition to confirmed species, therefore, the list includes several species which the author considers require confirmation, and some others, which it is premature to delete from the British list, but which must be considered as very doubtful records.

Sub-family names are printed as—*AGROMYZINAE*.

Generic names are printed as—*PHYTOBIA*.

Sub-generic names are printed as—*PHYTOBIA*.

Specific names are printed as—*silai* Hg.

Synonyms are indented.

Species requiring confirmation are shown with an asterisk.

Doubtful records are shown in brackets.

Species for which so far only records of the leaf mines exist are shown in italics.

The nomenclature follows Frick (1952) but the sub-genera *XENOPHYTOMYZA* of the genus *CERODONTA* and *NEMORIMYZA* of the genus *PHYTOBIA* set up by Frey (1946) are accepted.

#### **AGROMYZIDAE Fallén.**

##### *AGROMYZINAE* Fallén

##### *AGROMYZA* Fallén

*albipennis* Mg.

*albitarsis* Mg.

*alnibetulae* Hd.

*ambigua* Fall.

*anthracina* Mg.

*cinerascens* Macq.

*demeijeri* Hd.

*dipsaci* Hd.

*distorta* Griffiths

*felleri* Hg.

*ferruginosa* Wulp

*flaviceps* Fall.

*flavipennis* Hd.

*frontella* Rond.

*genistae* Hd.

*igniceps* Hd.

*intermittens* Beck.

*johannae* de Meij.

\**lathyri* Hd.

*lucida* Hd.

*mobilis* Mg.

*nana* Mg.

*nigrescens* Hd.

*nigripes* Mg.

nigrociliata Hd.  
 niveipennis Zett.  
 ocellaris Hd.  
 phragmitidis Hd.  
 reptans Fall.  
 rubi Bri.

sulphuriceps Str.  
 rubiginosa Griffiths  
 rufipes Mg.  
 abiens Zett.

\*salicina Hd.  
 spiraeae Kalt.  
 veris Hg.  
 vicifoliae Hg.  
 watersi Spencer (in litt.)

#### MELANAGROMYZA Hendel

aeniventris (Fall.)  
 cunctans (Mg.)  
 cunctata Hd.  
 dettmeri Hg.  
 euphorbiae Hd.  
 fuscociliata Hd.  
 lappae (Lw.)  
 nostradamus Hg.  
 pulicaria (Mg.)  
 schineri (Gir.)  
 simplex (Lw.)  
 simplicoides Hd.

#### OPHIOMYIA Braschnikov

alliariae Hg.  
 labiatarum Hg.  
 maura (Mg.)  
 curvipalpis (Zett.)  
 melandryi de Meij.  
 proboscidea Str.

#### TYLOMYZA Hendel

pinguis (Fall.)

#### PHYTOMYZINAE Fallén

##### PHYTOBIA Lioy

PHYTOBIA Lioy  
 barnesi (Hd.)  
 carbonaria (Zett.)  
 errans (Mg.)

NEMORIMYZA Frey  
 posticata (Mg.)

#### POEMYZA Hendel

atra (Mg.)  
 cingulata (Zett.)  
 incisa (Mg.)  
 graminis (Kalt.) partim  
 lateralis (Macq.)  
 muscina (Mg.)  
 pseuderrans (Hd.)  
 pygmaea (Mg.)

graminis (Kalt.) partim  
 pygmella (Hd.)  
 scutellaris (v. Ros.)  
 semiposticata (Hd.)

ICTEROMYZA Hendel  
 capitata (Zett.)  
 geniculata (Fall.)

AMAUROMYZA Hendel  
 \*lamii (Kalt.)  
 morionella (Zett.)

CALYCOMYZA Hendel  
 artemisiae (Kalt.)  
 humeralis (v. Ros.)

TRILOBOMYZA Hendel  
 flavifrons (Mg.)  
 exigua (Mg.)  
 labiatarum (Hd.)  
 verbasci (Bché.)

PRASPEDOMYZA Hendel  
 hylarella (Zett.)  
 monfalconensis (Str.)  
 morio (Bri.)

DIZYGOMYZA Hendel  
 bimaculata (Mg.)  
 caricicola (Hg.)  
 crassiseta (Str.)  
 iraeos (R.-D.)  
 iridis (Hd.)  
 luctuosa (Mg.)

grossicornis (Zett.)  
 morosa (Mg.)  
 sönderupi (Hg.)

#### CERODONTA Rondani

CERODONTA Frey  
 denticornis (Pz.)  
 fulvipes (Mg.)  
 spinicornis (Macq.)  
 lateralis (Zett.)

**XENOPHYTOMYZA** Frey  
*atronitens* (Hd.)  
*biseta* (Hd.)

**LIRIOMYZA** Mik  
*aesalon* Hg.  
*amoena* (Mg.)  
*artemisicola* de Meij.  
*brassicae* (Riley)  
*bryoniae* (Kalt.)

*solani* Hg.  
*centaureae* Hg.  
*cicerina* (Rond.)  
*demeijeri* Hg.  
*eupatoriana* Spencer  
*eupatorii* (Kalt.)  
*fasciola* (Mg.)  
*flaveola* (Fall.)  
*flavopicta* Hd.  
*impatiens* (Bri.)  
*lutea* (Mg.)  
*millefolii* Hg.

\**orbona* Hg.  
*orbonella* Hd.  
*pascuum* (Mg.)  
*pectoralis* (Beck.)  
*pedestrus* Hd.  
*pisivora* Hg. (in litt.)  
*polygalae* Hg.  
*pusilla* (Mg.)  
*pusio* (Mg.)  
*scorzoneræ* Ryd.  
*sonchi* Hd.  
*soror* Hd.  
*strigata* (Mg.)  
*tanacetii* de Meij.  
*taraxaci* Hg.  
*trifolii* (Burgess)  
*congesta* (Beck.)  
*triglochinae* Hd.  
*valerianae* Hd.  
*variegata* (Mg.)

**METOPOMYZA** Enderlein  
*alpicola* (Str.)  
*flavonotata* (Hal.)  
*scutellata* (Fall.)  
*violiphaga* (Hd.)

**PHYTOLIRIOMYZA** Hendel  
*perpusilla* (Mg.)

**PHYTAGROMYZA** Hendel  
*anteposita* (Str.)  
*discrepans* (V. d. Wulp)  
*flavocingulata* (Str.)  
*hendeliana* Hg.  
*heringi* Hd.  
*langei* Hg.  
*loniceræ* (R.-D.)  
*orphana* Hd.  
*populi* (Kalt.)  
*populicola* (Hal.)  
*populivora* (Hd.)  
*similis* (Bri.)  
*spinicauda* Hd.  
*tremulae* Hg. (in litt.)  
*tridentata* (Lw.)  
*tristriata* Hd.  
*[xylostei (R.-D.)]*

**PSEUDONAPOMYZA** Hendel  
*atra* (Mg.)

**NAPOMYZA** Haliday in West-  
 wood  
*elegans* (Fall.)  
*glechomæ* (Kalt.)  
*lateralis* (Fall.)  
*lonicerella* Hd.  
*nigriceps* (V.d.W.)  
*xylostei* (Kalt.)

**PHYTOMYZA** Fallén  
*aconiti* Hd.  
*adjuncta* Hg.  
*affinis* Fall.  
*agromyzina* Mg.  
*albiceps* Mg.  
*albipennis* Fall.  
*alpina* Groschke (in litt.)  
*[nalis Zett.]*  
*angelicæ* Kalt.  
*angelicæstri* Hg.  
*anthrisci* Hd.  
*aquilegiæ* Hardy  
*asteris* Hd.  
*atricornis* Mg.

*bellidina* Hg.  
*bipunctata* Hd.  
*brunnipes* Bri.  
*calthivora* Hd.  
*calthophila* Hg.  
*campanulae* Hd.  
*cana* Ryd. (in litt.)  
*chaerophylli* Kalt.  
*cineracea* Hd.  
*cinerea* Hd.  
*cirsii* Hd.  
*conii* Hg.  
*conopodii* Hg.  
*conyzae* Hd.  
*corvimontana* Hg.  
*crassiseta* Zett.  
*cytisi* Bri.  
*enigmoides* Hg.  
*eupatorii* Hd.  
*fallaciosa* Bri.  
*flavicornis* Fall.  
 [flaviventris Zett.]  
*fulgens* Hd.  
*gentianae* Hd.  
*hendeli* Hg.  
*heracleana* Hg.  
*heringiana* Hd.  
*ilicis* Curt.  
*intermedia* Spencer (in litt.)  
*lappina* Gour.  
*leucanthemi* Hg.  
*luzulae* Hg.  
*matricariae* Hd.  
*melana* Hd.  
*milii* Kalt.  
*minuscula* Gour.  
*nigra* Mg.  
*nigricoxa* Hd.

*nigripennis* Fall.  
*nigritella* Zett.  
*notata* Mg.  
*obscura* Hd.  
*obscura* Fall.  
*pastinacae* Hd.  
*periclymeni* de Meij.  
*petöi* Hg.  
*pimpinellae* Hd.  
*plantaginicaulis* Hg.  
*plantaginis* R.-D.  
*podagrariae* Hg.  
*primulae* R.-D.  
*pseudohellebori* Hd.  
*pubicornis* Hd.  
*ramosa* Hd.  
*ranunculi* (Schrk.)  
*ranunculivora* Hg.  
*robustella* Hd.  
*rufipes* Mg.  
*scabiosae* Hd.  
*scolopendrii* R.-D.  
*silai* Hg.  
*solidaginis* Hd.  
*sonchi* R.-D.  
*insperata* Hd.  
*sphondylivora* Spencer (in litt.)  
*spondylii* R.-D.  
*symphyti* Hd.  
*tanaceti* Hd.  
*taraxaci* Hd.  
 [tenella Mg.]  
*tordylii* Hd.  
*tussilaginis* Hd.  
*varipes* Mg.  
*virgaureae* Hg.  
*vitalbae* Kalt.  
*vulnerariae* Spencer (in litt.)

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11 Christchurch Hill, Hampstead.  
20th July 1955.

## THE BIOLOGY OF DRAGONFLIES.

By A. E. GARDNER, F.R.E.S.

Read 14th April 1954.

“ Deep in the sun-searched growths the dragon fly  
Hangs like a blue thread loosened from the sky.”

—*Rossetti.*

The Odonata may be defined as predaceous insects having biting mouth-parts, large and prominent compound eyes, three ocelli and short setaceous antennae. The prothorax is small and movable, the mesothorax and metathorax large, fused to form the pterothorax, the side and anterior portion of which are greatly elongated so the legs are placed forward and the wings placed far backward. The two pairs of equal or sub-equal wings are hyaline or partly opaque, have a reticulate and highly specialized venation, a nodus and nearly always a pterostigma. Abdomen consisting of ten segments, elongate and sometimes very slender; tergites large, enfolding the narrow sternites. In the Anisoptera the male anal appendages consist of a pair of superior and a single inferior appendage, in the Zygoptera paired superior and inferior appendages. Females of both suborders possess only a single pair of superior anal appendages. Male genitalia consisting of a genital pore on the ninth sternite and complicated accessory genitalia developed from the second and anterior portion of the third sternites. Female with ovipositor complete or reduced. Metamorphosis is incomplete. The larvae or “ nymphs ” with a few notable exceptions are aquatic, respire by rectal or caudal gills and seize their prey by a unique prehensile modification of the labium, more commonly known as the “ mask.”

The Odonata is an ancient order and forms an evolutionary line independent of the other insects. The oldest known winged insects or Pterygota are known from the Upper Carboniferous of Europe and N. America. Two distinct types are represented, viz.: The Neoptera, characterised by their ability to flex the wings and fold them backward roof-like over the abdomen, and the Palaeoptera, characterised by forms in which the wings can not be flexed and folded backward roof-like. Only the Mayflies and Dragonflies now represent the ancient Palaeopterous orders, and although standing far apart from each other, they are even more remotely connected to all other existing orders. According to Fraser (1954b) the fossil order Protodonata gave rise to the order Protozygoptera and from this arose part of the order Odonata, the suborders Zygoptera and Anisozygoptera (the latter with only a single living genus in E. Asia). The Anisoptera which contains the most highly specialized forms was evolved in turn through the Anisozygoptera.



In the *Zygoptera* the imagines are characterised by forms in which the button-like eyes are set widely apart, the fore- and hind-wings are similar, with narrow bases, and with the exception of the *LESTIDÆ*, are closed together over the abdomen when at rest. The larvae are generally long and slender, and respiration is mainly carried out by means of three leaf-like caudal gills. The *Anisoptera* are generally stouter insects, and in the imagines the eyes meet, or nearly meet mid-dorsally. The fore- and hind-wings are of variable shape, the hind usually considerably broader at the base than the fore, in repose the wings are held horizontally or depressed. The larvae are generally of more robust build than those of the *Zygoptera*, and respire by means of anal valves and rectal gills. The *Anisozygoptera* marks the transition of the *Anisoptera* from the *Zygoptera*, the imagines showing facies of both suborders. The larvae have the general facies, labial mask and anal appendages of the *Anisoptera*.

There has been no recent census of the world species but it probably numbers over six thousand species. The Neotropical region is exceedingly rich in Odonata, the number of species and entogenic genera exceeding that of any other region. The Nearctic region is as poor in *Zygoptera* as the Neotropic is rich, in the *Anisoptera* the *Gomphini* and *Eucorduliini* are richly developed. The Palaearctic region although of great extent is by far the poorest in Odonata in the whole world. Japan, however, contains a striking dragonfly fauna, many species of which are of great beauty as representations in art testify. The Ethiopian region, although neither so rich nor so varied in its forms as the Neotropical and Oriental regions, has, nevertheless, a fairly rich and distinct fauna. In the Oriental region the *AGRIDÆ* are represented by many species remarkable for their glorious wing-coloration. The Australian region is notable for its archaic complex of forms and the irruption of Oriental forms into the more tropical parts of the region.

### INTERNAL STRUCTURE.

*Circulatory System*: In the larva the dorsal vessel consisting of the heart and narrow aorta lie dorsally above the alimentary canal. A ventral blood sinus is present in the imago, this is in close relation with the main nerve cord. The heart consists of eight chambers, has contractile walls and occupies the abdominal segments 2 to 9. It is differentiated into two very distinct portions—the hind or receptive and the fore or conductive heart. The receptive heart consists of two chambers lying in the 8th and 9th segments, each chamber performing the function of pumping blood into the chamber in front of it, also receiving blood from the haemocoel by means of ostia. Its walls are more muscular and its powers of contraction and expansion greater than those of the fore heart. Ostia opening on each side are guarded by valves directed slantingly forwards, each valve being carried along the side and ending in a larger flap which forms a valve separating each chamber.

The conductive heart consists of six chambers each opening into the one before it by means of a pair of valves. The ostia are replaced by a pair of oval organs termed osteles, these are thought to be reduced and closed up ostia (Tillyard, 1917). The aorta is a straight non-contractile tube which carries the blood forward through the thorax into the head, opening into the haemocoel above the brain.

*Alimentary Canal:* The alimentary canal consists of three main regions. The most anterior of these, the fore-gut, is an invagination of the ectoderm in the region of the mouth; the hind-gut is a like invagination of the anus. Between these lies the mid-gut. In the Odonata it is the mid-gut alone which carries out the process of digestive secretion and absorption. The fore-gut serves to prepare the food for digestion, the hind-gut to remove the waste products left over.

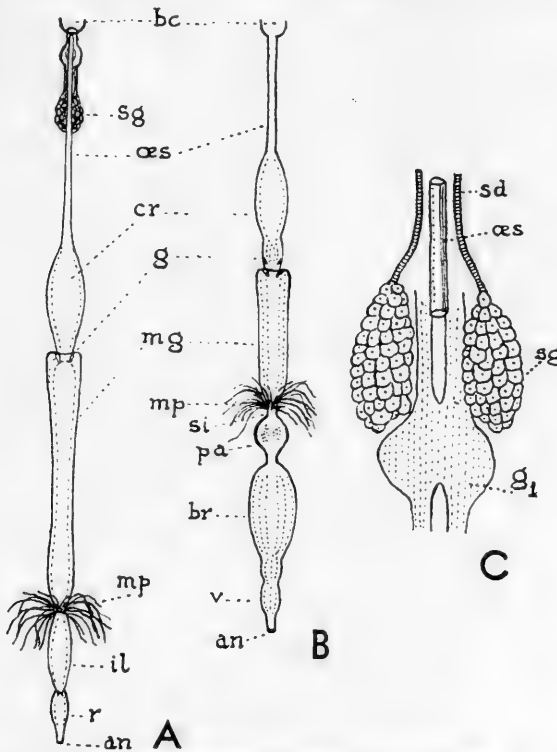


Fig. 1. Alimentary canal of *Aeshna brevistyla* Ramb. A, imago; B, larva; C, salivary glands of *Platycnemis pennipes* (Pallas) larva. an, anus; bc, buccal cavity; br, branchial basket; cr, crop; g, gizzard; g1, prothoracic nerve-ganglion; il, ileum; mg, mid-gut; mp, Malpighian tubules; oes, oesophagus; pa, pre-rectal ampulla; r, rectum; sd, salivary duct; sg, salivary glands; si, short intestine; v, vestibule. After Tillyard.

An examination of the alimentary canal in more detail (Fig. 1) shows that the fore-gut has two salivary glands, these are small, placed on either side and close to the oesophagus and are peculiar in having the reservoirs situated along the course of the ducts. The crop is a large dilation of the oesophagus, is closed off from the gizzard by a

strong sphincter and at metamorphosis becomes dilated with air. The larval gizzard is highly specialized, posteriorly armed with dental folds of four to sixteen in number. In the imago the gizzard is comparatively weak and small. The mid-gut of the larva is markedly shorter than in the imago, and is notable in possessing no caeca and by its ability to deal with large meals at infrequent intervals. At its posterior end there is a strong sphincter muscle which effectively prevents the passage of impurities from the hind-gut. Below the sphincter muscle and in the anterior region of the hind-gut, lies the zone of entry of the Malpighian tubules. These number three in the newly emerged larva but increase rapidly in number at each moult, and in mature larvae and in imagines may number from fifty to seventy. Their function is to extract the nitrogenous and other waste products from the blood (Griffiths, 1888). The imaginal rectum is short, in the larva, however, it is elongated and in the Anisoptera, highly specialized and dilated to accommodate the rectal gills which form an elaborate structure known as the branchial basket (Fig. 2).

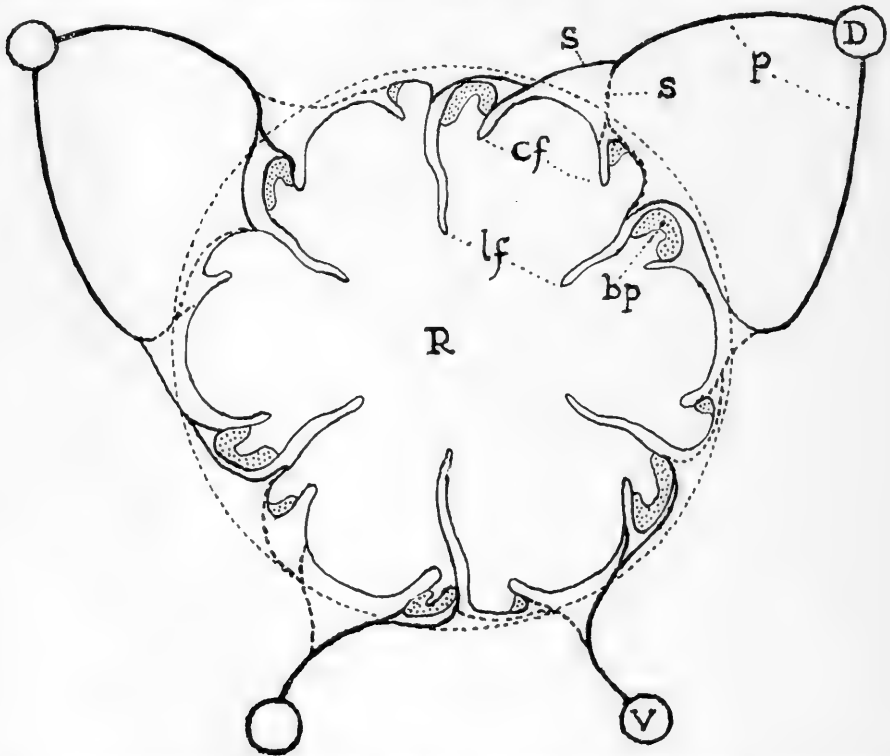


Fig. 2. Diagrammatic transverse section of branchial basket of *Austrogomphus* larva. *bp*, basal pad; *cf*, cross fold; *d*, dorsal tracheal trunk; *lf*, longitudinal fold; *R*, branchial basket; *p*, primary efferent trachea; *s*, secondary do.; *v*., visceral tracheal trunk. Adapted from Tillyard.

*Respiratory System*: In the imago the tracheal system is of the 'open' type, air being drawn directly through the functional spiracles. The larvae had originally a similar system but by adopting an aquatic

mode of life the spiracles ceased to be useful except on special occasions, such as metamorphosis; they have persisted although now generally functionless. In mature larvae the mesostigma is well formed, it is open and can become functional whenever the larvae have need to leave the water for a time. It is an interesting fact that the AESHNIDAE larvae frequently wander about rocks and other damp places at night. Apart from these exceptions the requisite oxygen is obtained by the agency of a system of specially developed tracheal gills from which branches known as efferents pass into the main tracheal trunks.

The tracheal gills have developed in the larvae of Odonata in three places. (1) In all Anisoptera, within the anterior portion of the rectum, a specialization of the epithelium and pads forming the complex branchial basket. By forcibly ejecting the water out of the branchial basket the larvae of this suborder can rapidly propel themselves forwards. (2) In most Zygoptera, on the three anal appendages, these being known as the caudal gills or lamellae. (3) On certain of the abdominal segments in a few archaic AGRIIDAE (Fig. 3).

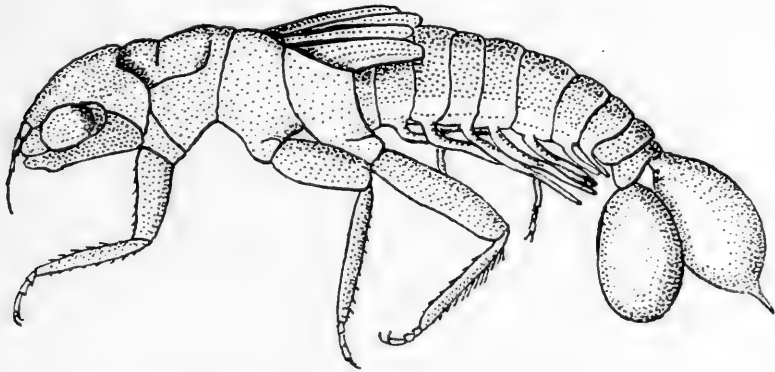


Fig. 3. Larva of *Pseudophaea*. After Tillyard.

*Nervous System and Sense Organs:* The nervous system is characterized by eight abdominal ganglia, the first being quite distinct from the metathoracic ganglion, but becoming fused with the latter in the imago (Tillyard, 1917). Correlated with the great development of the eyes in the imago, the optic ganglion forms the most complicated portion of the cephalic nerve-mass. The sense of touch is well developed, particularly in the mouth-parts, legs and abdominal appendages. The mouth-parts, particularly the labrum and epipharynx bear numerous organs of taste and touch. Berlèse (1909) has described two small processes on the anterior portion of the prothorax in *Aeshna* which, rubbing against two roughened patches behind the eyes produce a sound. These he described as stridulating organs, and it is notable that in 1953 a male *Aeshna cyanea* (Müll.) which I held by the wings did produce a scraping sound as the head was moved up and down. More observations are required on this interesting point. Asahina (1954) describes a stridulatory mechanism in the larva of *Epiophlebia superstes*

Selys (Anisozygoptera). The femora of the metalegs are serrated on the edges, the external side of which is brought into contact with minute sound producing files on the lateral edge of the abdominal tergites. Stridulation is produced by the twisting of the abdomen from side to side, the legs being kept still on both sides of it.

*Muscular System*: The muscular system is highly developed and without exception the muscles are striated (Zawarsin, 1911). The mechanism of the wing-muscles is of special interest, as in the Odonata the muscles of the synthorax are directly connected with the wing-bases by means of tendons, and not with the notum as in other insects. The fore- and hind-wings are completely independent and there is only one true axillary or wing-pivot.

### EXTERNAL STRUCTURE OF THE IMAGO.

*Head*: The shape of the head, sizes and relationships of its parts have become modified in correlation with the development of the large compound eyes (Fig. 4). The vertex bearing three ocelli is flat in most Zygoptera, but in the Anisoptera becomes raised. The antennae are inconspicuous, setaceous and consist of from three to seven segments,

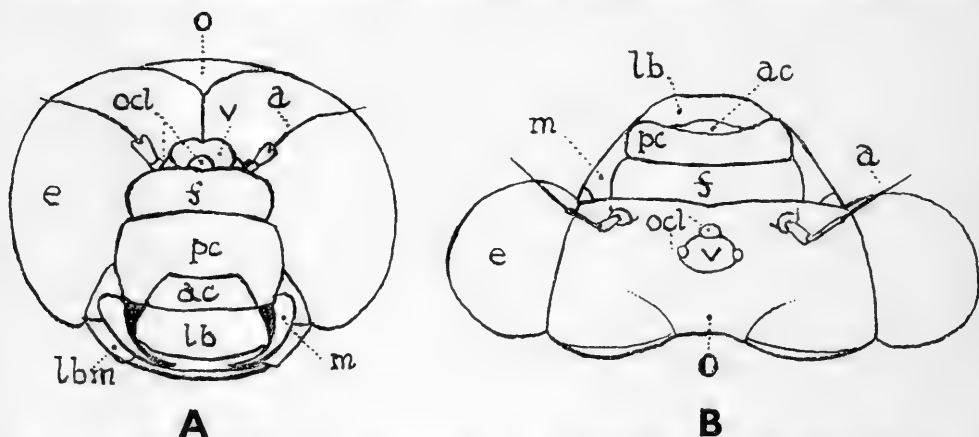


Fig. 4. Head of imago. A, Anisoptera. B, Zygoptera. *a*, antenna; *ac*, anteclypeus; *e*, compound eye; *f*, frons; *lb*, labrum; *lbm*, labium; *m*, mandible; *o*, occiput; *ocl*, ocelli; *pc*, postclypeus; *v*, vertex.

the latter being the usual number. The mouth-parts (Fig. 5) are of the biting type, mandibles with incisor and molar teeth, maxillae smaller, with unjointed palp and long, curved teeth on the mesal margin. The labium is large, scoop-shaped, and, consisting of three subequal lobes, holds the prey while it is being masticated by the mandibles.

*Thorax*: The prothorax is distinct, greatly reduced in size and in the Zygoptera is generally provided with elaborate ridges and lobes correlated with the specific forms of the male anal appendages which in pairing grip the posterior lobe. The meso- and metathorax are fused to form the powerful pterothorax, the pleura of which are greatly elongated backward and upward. This arrangement results in the

backward displacement of the tergal region and the forward displacement of the thoracic sterna together with the legs (Fig. 6). The latter are, therefore, in an ideal position for acting as a trap for catching and holding the prey whilst in flight. By virtue of the forward position of the legs, perching is generally in a vertical or oblique position—on an upright reed, or hanging from a twig.

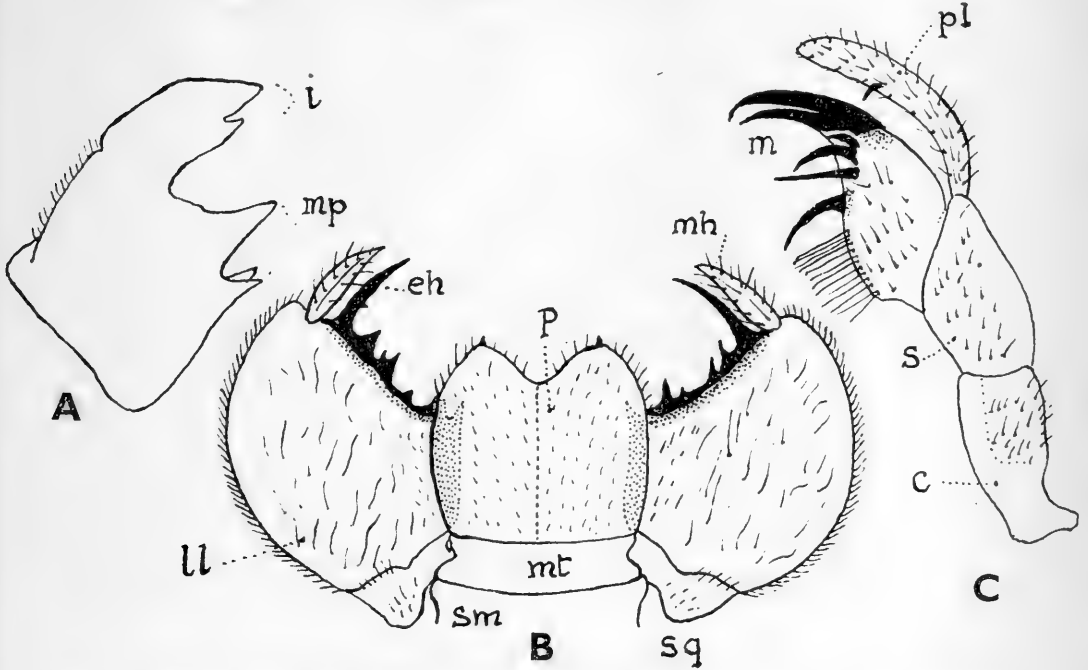


Fig. 5. Mouth-parts of *Cordulegaster bottomi* (Don). Imago. A, left mandible; B, labium; C, left maxilla. *c*, cardo; *eh*, end-hook; *i*, incisors; *ll*, lateral palp; *m*, mala; *mh*, movable-hook; *mp*, molar process; *mt*, mentum; *p*, prementum; *pl*, palp; *s*, stipes; *sq*, squama; *sm*, submentum. After Imms.

The GOMPHIDAE habitually rest in a horizontal position and doubtless correlated with this habit, the hind tibiae are much shorter than the hind femora. The legs are armed with numerous spines or long, stiff setae; tibial and femoral combs (Cowley, 1937) are present in the great majority of Odonata.

**Wings:** The membrane is hyaline or partly opaque, coloured or uncoloured, without hairs or scales,\* but with numerous fine spines on the undersurface of the supporting ribs or nervures. The venation is highly specialized and forms the chief character for distinguishing the major groups down to generic level. Six main longitudinal veins which alternate at high (+) or low (−) levels are connected by very numerous, shorter cross-veins. The six main longitudinal veins are: Costa (+), Subcosta (−), Radius (+), Medius (+), Cubitus (−) and Anal (+).

\**Tricholestes risi* (Weele) from New Guinea has the veins at the base of the hindwings coated with long hairs.

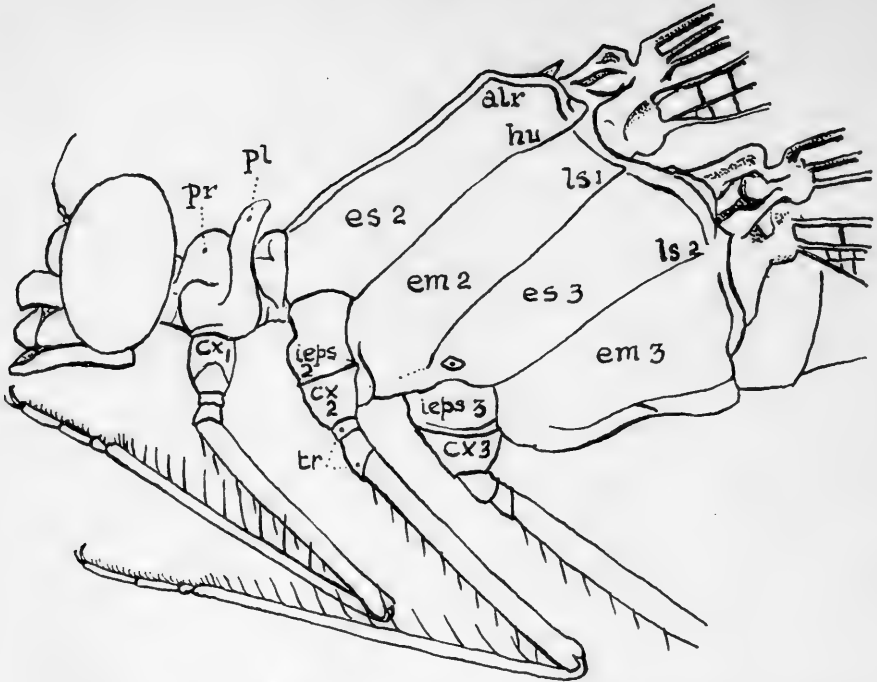


Fig. 6. Prothorax and thorax of a Zygopterous dragonfly. *alr*, ante-alar carina; *cx1*, *cx2*, *cx3*, coxae; *em2*, mesepimeron; *em3*, metepimeron; *es2*, mesepisternum; *es3*, metepisternum; *hu*, humeral suture; *ieps 2*, mesinfraepisternum; *ieps 3*, metinfraepisternum; *ls 1*, *ls 2*, first and second lateral sutures; *pl*, posterior lobe; *pr*, prothorax; *tr*, trochanter. Adapted from Walker.

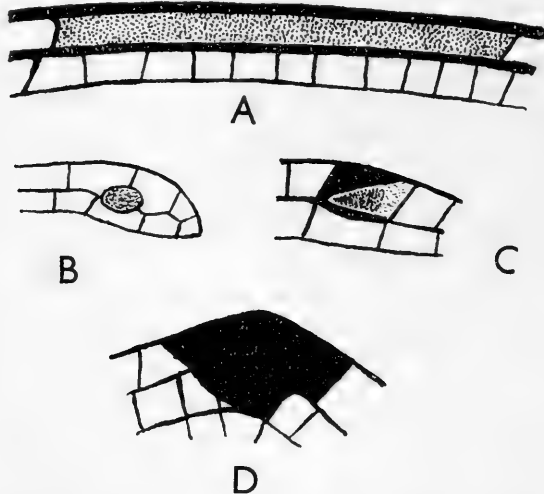


Fig. 7. Forms of pterostigma. A, *Petalura ingentissima* Tillyard. B, *Anomalagrion hastatum* Say. C, *Ischnura heterosticta* Burm., ♂, fore-wing. D, *Mectstogaster lucretia* Drury, ♂ fore-wing. After Tillyard.

The pterostigma (Fig. 7) although present in other orders of insects is never so constant or so conspicuous as in the Odonata. It may be unicolourous, parti-coloured or brightly coloured. A variety of shapes

occur within the order; it may be exceedingly long and narrow as in the archaic *Petalurinae*, form a costal hump in *Mecistogaster*, sink below the level of the costa in *Anomalagrion* or may be reduced or absent in *AGRIIDAE*, the species of which exhibit a weak sculling type of flight.

Space will not permit discussing the Odonate venation as fully as this important character justifies; for further details reference should be made to the important works by Fraser, Needham, Munz and Tillyard.

**Abdomen:** Generally sub-cylindrical, long and narrow, but in the *LIBELLULIDAE* may be comparatively short and broad, strongly depressed and laterally expanded, while in many *GOMPHIDAE* and *CORDULIDAE* it is club-shaped. In the *Pseudostigmatinae* it has become excessively long and slender, correlated with the habit of ovipositing in the water collected between the bases of leaves of epiphytic Bromeliads. The male genital pore is situated on the ventral surface of the 9th segment, and an external accessory genitalia on the ventral surface of segment 2 and the anterior portion of segment 3. This unique and complex structure consists of a 3-segmented penis, vesicle, protecting sheath and hamules, all lying in the deeply grooved cavity or genital fossa. Unlike the Anisoptera, in the *Zygoptera* (Fig. 8) the penis is not connected to the vesicle, nor with any part of segment 3, and its lumen opens into the haemocoel. The gelatinous sperm-capsule is transferred from the genital pore to the accessory genitalia (Plate XII, Fig. 9) by the male curling its abdomen underneath until the two organs are in juxtaposition. The female genitalia situated on the ventral surface of the 8th and 9th segments, in the *Zygoptera* and archaic Anisopterous

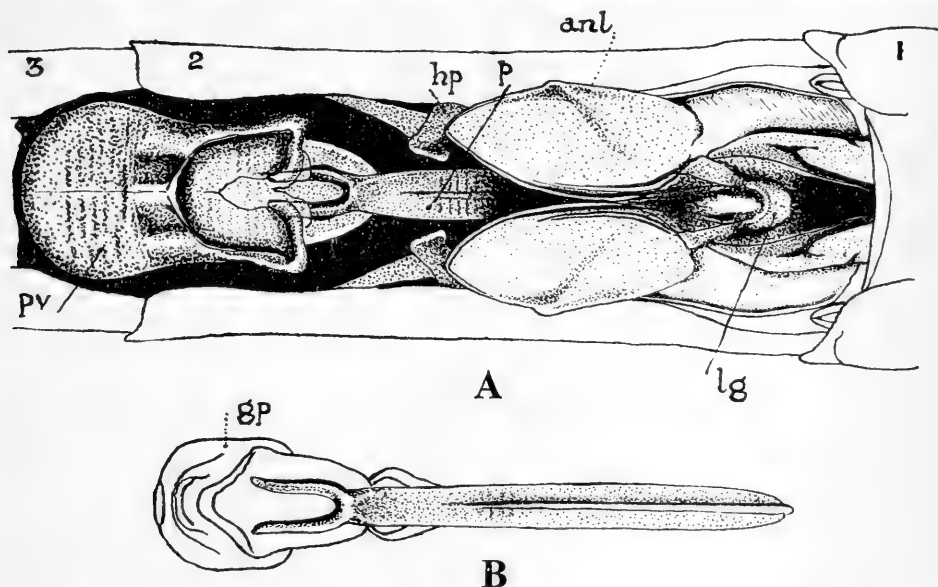


Fig. 8. Male accessory genitalia. *Lestes dryas* (Kirby) (*Zygoptera*). A, ventral aspect. B, penis. anl, anterior lamina; hp, hamule posterior; gp, glans penis; lg, ligula; p, penis; pv, penis vesicle; 1, 2, 3, first three abdominal segments.



families AESHNIDAE and PETALURIDAE, consists of a well-developed ovipositor. Formed from three pairs of processes, the terebra consists of the anterior and posterior gonapophyses. It is curved, pointed and furnished with serrated edges for piercing and cutting the tissues of plants in order to insert the eggs. The lateral processes form a sheath for the terebra and are provided with an apical tactile style. In the CORDULEGASTERIDAE the ovipositor is elongate but vestigial, whilst in the remaining families of the Anisoptera it is generally greatly reduced (Fig. 9), correlated with the method of exophytic oviposition. In some species of CORDULIDAE and LIBELLULIDAE, however, the vulvar lamina is scoop-like, and in certain exotic LIBELLULIDAE extends beyond the end of the abdomen. Well-developed auricles or oreillets (Fig. 10) occur on the sides of segment 2 in the males of many genera of the Anisoptera and in the EPALLAGIDAE in the Zygoptera. Fraser (1943) has interpreted these as "directors" by which the female during copulation finds the male accessory genitalia.

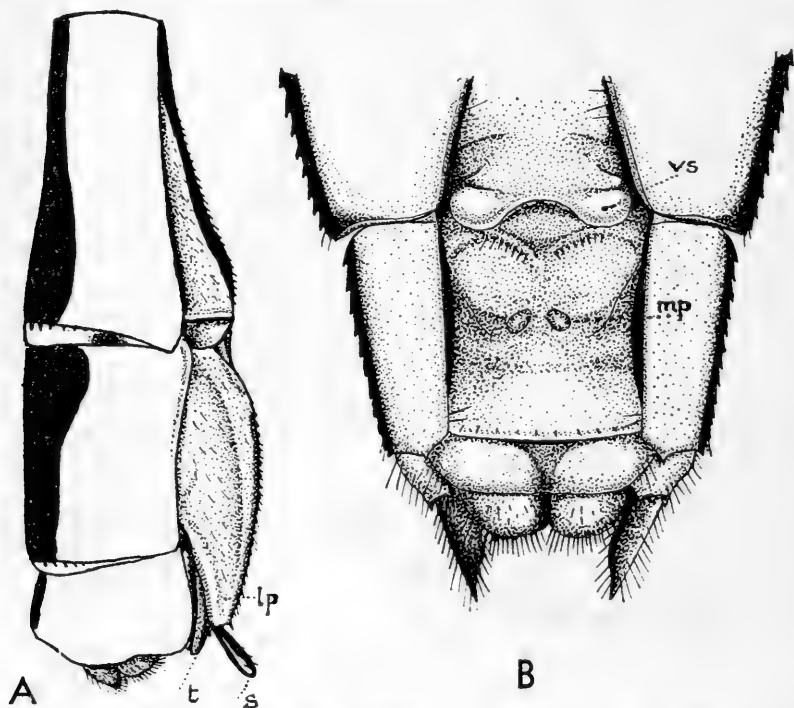


Fig. 9. Ovipositor. A, *Coenagrion hastulatum* (Charp.) (Zygoptera). B, *Libellula depressa* L. (Anisoptera). *lp*, lateral process; *mp*, median process; *s*, style; *t*, terebra; *vs*, vulvar scale.

The anal appendages exhibit a great variety of shapes and assist identification of many species. Anisopterous males possess two superior and a single inferior anal appendage, the latter, situated above the anus, is developed from the epiproct of the larva, the former developing from the larval cerci. Zygopterous males besides possessing two superior anal appendages are provided with two inferior appendages

situated below the anus, and developed from the larval paraprocts. Females of both suborders possess only a single pair of superior anal appendages. The anal appendages are used by the male to seize and hold the female by the head or prothorax during copulation (Plate XIII, Fig. 14).

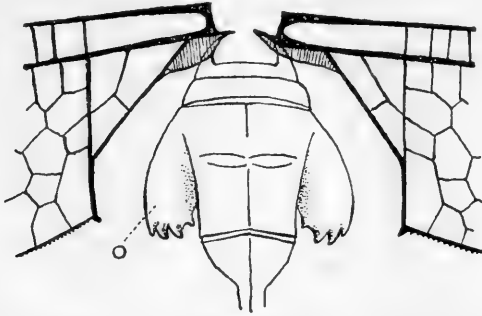


Fig. 10. Bases of hind-wings of *Gynacantha membranalis* Karsch. o, ocellus. After Fraser.

**Coloration:** The Odonata are surpassed only by the Lepidoptera in the beauty and brilliance of coloration. Three main types of colouring occur within the Order: (1) Optical or interference colours due to pigments embedded in the cuticle. The metallic greens, blues and purples found in the CORDULIDAE, AGRIIDAE and LESTIDAE, are well known examples. (2) Hypodermal colours due to pigments formed either in or above the hypoderm cells. The vivid reds, yellows, greens and blues which occur in so many species belong to this group. (3) Pruinescence or powder-colours which occur at maturity and are most notable in the males. Sexual dimorphism is common and in the *Ischnura*, *Ceratura*, *Anomalagrion*, *Agriocnemis* and *Austrocnemis* two colour forms of the female occur.

#### EXTERNAL STRUCTURE OF THE MATURE LARVA.

The larvae exhibit a variety of form (Plate XIV, Figs. 15-21), and are generally stouter than the adults, their coloration being of the cryptic type. The larvae of the Zygoptera are more slender than those of the Anisoptera and bear three caudal lamellae or gills.

**Head:** Eyes smaller and more forwardly placed, ocelli barely indicated or prominent. The antennae are relatively longer than in the adult and generally consist of six or seven segments, in the GOMPHIDAE three or four. The mandibles in *Pseudophaea* and *Cora* are biramous. With these exceptions they closely resemble those of the adult. The labium is unique, the pre- and submentum, labial palpi and movable hooks, forming a prehensile arm commonly known as the "mask". The submentum is directed backward between the legs, the prementum directed forward, bearing the labial palpi hinged at the junction of its distal and lateral margins. The labial palpi are provided with a strong movable hook at their outer distal angle. The labium exhibits a great variety of forms (Fig. 11), in the AESHNIDAE and GOMPHIDAE it is flat

and without major premental or palpal setae, in the CORDULIIDAE, CORDULEGASTERIDAE and LIBELLULIDAE, scoop-shaped and bearing numerous premental and palpal setae. In the archaic PETALURIDAE the labium is broad and slightly concave. It probably assists the larva to shovel out its mud-canals. In the Zygoptera the labium is generally flattened, highly differentiated and ladle-shaped in the LESTINAE, the median cleft of the prementum elongated and wide in the AGRIIDAE, generally triangular in outline in the COENAGRIIDAE. In most species numerous premental and palpal setae are present. The prey is seized by the labium being rapidly extended, the hapless victim being held by the movable hooks on the labial palpi. The palpi are automatically closed with the return and folding of the labium, thus securely holding the prey aided by the major setae. The LIBELLULIDAE, especially *Sympetrum* and *Leucorrhinia*, have the ability to extend the labium at an acute angle in addition to making shots at prey directly in front of the larva.

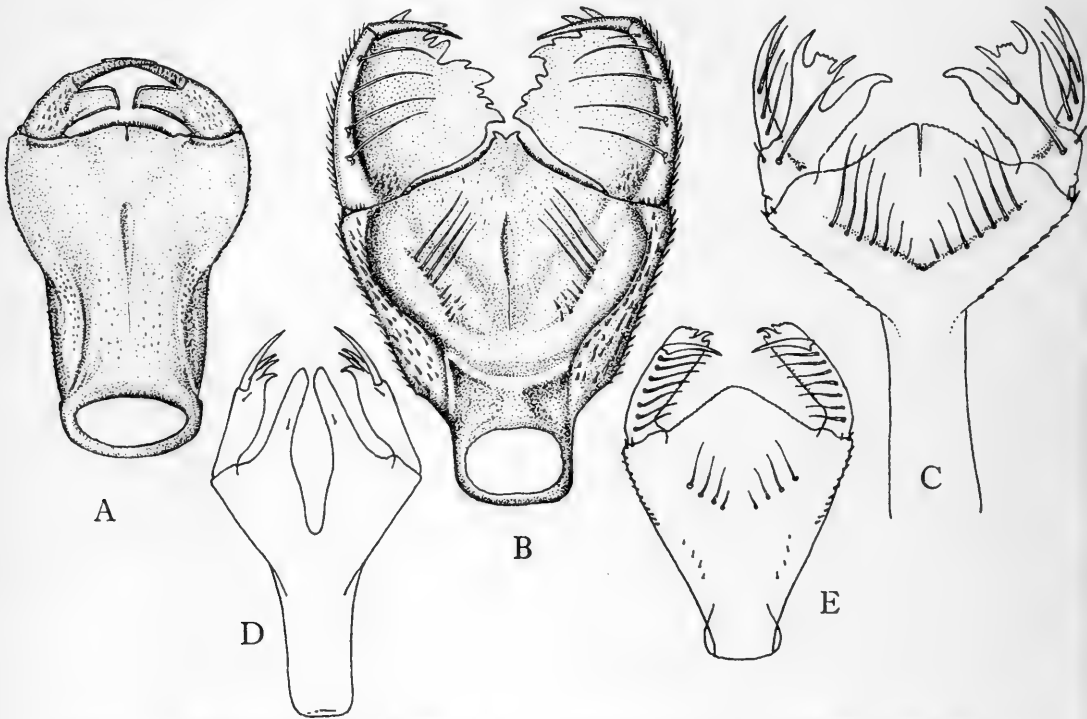


Fig. 11. Variation in the form of the larval labium. A, *Aeshna grandis* (L.). B, *Cordulegaster boltoni* (Don.). C, *Lestes dryas* Kirby. D, *Agrion virgo* (L.). E, *Pyrrhosoma nymphula* (Sulz.).

**Thorax:** The prothorax is free and generally relatively larger than in the adult. The pterothorax is generally robust, the skewness not so pronounced as in the adult, this enabling the legs to be used for walking and climbing. The mesostigmata are generally conspicuous and functional in the adult larva. The legs show a variety of form correlated with the habits of the larvae. The Zygoptera, and in the

Anisoptera, the CORDULIDAE larvae of which crawl amongst the vegetation, possess long, slender legs, burrowing species such as the GOMPHIDAE possess short legs, the front tibiae being flattened and hooked. Tibial combs (Fig. 12) are provided for cleaning purposes. These consist of bidentate setae in the LESTIDAE, but in other families are generally tridentate. A breaking-joint is provided between the femur and small trochanter, this enabling a larva to escape if a leg is seized by an enemy.

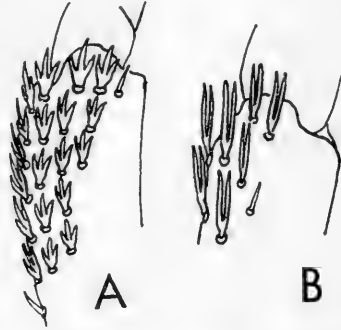


Fig. 12. Tibial combs of larvae. A, PLATYCNEMIDIDAE and COENAGRIIDAE. B, LESTIDAE.

*Wing-sheaths*: The hind wings overlap the fore and are held parallel except in some genera such as *Ophiogomphus* and *Cordulegaster* which have them divergent.

*Abdomen*: Generally long and slender in the Zygoptera, lateral spines being inconspicuous or absent. In the Anisoptera the abdomen shows a greater variety of form, but is, however, always shorter and more stout than that of the adult. Dorsal hooks and lateral spines may be present, these often being of great aid to identification. In males the accessory genitalia on the 2nd sternite is rudimentary but evident. In females the genitalia on the 8th and 9th sternites may be evident, in the Zygoptera it is always conspicuous. In the Anisoptera the anal appendages consist of three main appendages (Fig. 13), the epiproct situated above the anus, the paraprocts lateroventrally. Together they form the anal pyramid which spreads apart to allow the inflow of water through the anus into the branchial basket. Sudden expulsion of the water causes the larva to be propelled forward by jet propulsion. The cerci are situated above the paraprocts and give rise to the adult superior appendages. The inferior appendage of the adult male is evolved from the male projection, evident at the base of the epiproct.

In the Zygoptera the epiproct and paraprocts (true larval appendages) form the basal portion of the three caudal lamellae or gills. These are provided with a breaking-joint, and are penetrated by two main longitudinal trachae; from these, numerous trachae radiate to the dorsal and ventral margins. The lamellae vary considerably in form (Plate XV, Figs. 22-27) and in a few species of *Argia* and the Hawaiian

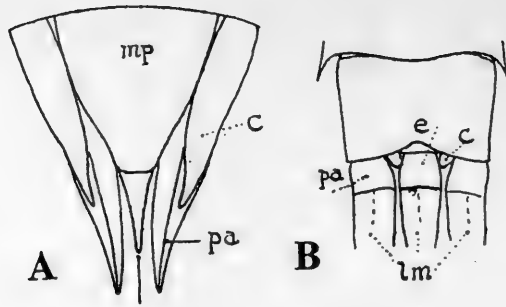


Fig. 13. Larval anal appendages. A, *Cordulia aenea* (L.) ♂, dorsal view (Anisoptera). B, *Lestes sponsa* (Hans.) ♂, dorsal view (Zygoptera). c, cercus; e, epiproct; pa, paraproct; mp, male projection; lm, lamellae.

*Megalagrion* they are considerably reduced and somewhat resemble the appendages of the Anisoptera. Three main types of lamellae are found: (1) The triquetral gill, triangular in cross-section and with the cuticle thickened it is the type found in the lateral gills of *Agrion*. (2) The saccoid gill, this developed from the triquetral type, appears confined to the *Epallaginae*, *Thorinae* and *Protoneurinae*. In *Pseudophaea* they are greatly swollen with a tapering tip, in the *Protoneurinae* constricted sacci are found in *Neosticta* and *Nososticta*, the larvae of which are rock-dwellers. (3) The lamellar gill, this type showing a variety of form. In the *Isosticta* it is constricted, the change from saccoid to lamellar appearing to be correlated with change from rock-dwelling to the free-living habit of the larva (Tillyard, 1917). The nodate lamella, a fairly common type found in *Pseudagrion*, *Caliagrion*, *Austroagrion*, *Erythromma* and some species of *Coenagrion*. The subnodate, a type found in *Enallagma*, *Ischnura*, etc., the node indicated by the termination of the strong prenodal setae and a faint trace of the transverse joint. Finally the denodate type as found in *Platynemis*, *Pyrrhosoma*, etc., in which all trace of the node is lost. Opinions differ as to the part played by the lamellae in respiration. Certainly the larvae do not appear to suffer any hardship if they are cast off. Bodine (1918) states respiration is rectal, oxygen is carried by the blood, not by the tracheae, and that there is no evidence that the lamellae have a respiratory function. Koch (1934), however, found that in *Coenagrion pulchellum* (Van der Lind.) 32 to 45 per cent. of the oxygen uptake normally enters by the lamellae. It is notable that specimens kept in aquaria in which the water has become fouled, spread the lamellae on the surface of the water and that *Ceriagrion tenellum* (Villiers) opens and snaps shut the lateral lamellae as if to stir up the water. The lamellae also provide a secondary means of propulsion. This is achieved by vigorously swaying the abdomen and lamellae from side to side, the legs being held close to the sides of the abdomen.

#### DEVELOPMENT.

*The Egg*: These fall into two distinct types. The Zygoptera and Anisopterous families, PETALURIDAE and AESHNIDAE, which practise endophytic oviposition produce elongate eggs; species which have

exophytic oviposition produce ovoid eggs. The anterior pole bears a small pedicel to which the egg-string is attached, in colour the eggs are pale when first deposited, later turning darker, in many species of the LIBELLULIDAE, reddish-brown. Generally the chorion bears little trace of pattern derived from the follicle cells. In *Aeshna cyanea* (Müll.), however, the hexagonal pattern extends the length of the egg (Plate IX, Fig. 1) and in *A. mixta* Latr., it is confined to the apical third (Gardner, 1950b). Generally the ovoid eggs are enveloped in a gelatinous covering which protects them from contact with the air and anchors them to the debris on which they fall. The number of eggs deposited varies greatly, although probably the average is from 200 to 300 (Calvert, 1893), this number is exceeded in species which practise exophytic oviposition. Needham states that he "obtained 5,200 eggs from an ovipositing female of *Gomphus externus* Selys that had already deposited a part of her stock" (Needham and Heywood, 1929).

The egg of *Anax imperator* Leach (Plate IX, Fig. 2) is equipped with a blade-like extension of tissue projecting beyond the anterior pole (Robert, 1939). Corbet (*in litt.*) has established that it is double-layered, cone-shaped, the base continuous with the chorion, the distal region truncate and open. Since the distal end only is ruptured during hatching it is obviously used as a passage by the emerging prolarva. Similar structures are evident in the eggs of *Anax junius* (Drury) (Needham, 1901) and *Aeshna isosceles* (Müll.) (Gardner, 1955) both species which lay non-diapause eggs. It is thought that the cone-shaped structure prevents the plant tissue from enclosing the egg before hatching, its absence being notable in species laying aestivating eggs, the plant tissue therefore decomposing before hatching. In the Zygoptera a cone-shaped structure projecting from the anterior pole is evident in the eggs of *Coenagrion hastulatum* (Charp.) and *C. puella* (L.) (Gardner, 1954a) (Plate IX, Fig. 3).

The incubation period varies greatly, the water temperature being an important factor. *Tramea lacerata* Hagen has been found to hatch in five days (Bick, 1951) but probably the majority of species hatch in from two to three weeks. Many species, notably *Lestes*, *Boyeria* and *Aeshna* lay eggs in late summer, a winter diapause preventing hatching before the spring.

*Hatching*: (Fig. 14) The process of hatching has been well described by Walker (1953). "Preparation for hatching is initiated by peristaltic movements of the stomodaeum, which pass from the mouth backwards and are synchronous with rhythmical contractions of the dilator muscles of the pharynx (Grieve, 1937). Fluid from the amniotic cavity is swallowed but is apparently accumulated within the stomodaeum, causing a swelling of the head region. The resulting pressure upon the front of the head causes a rupture of the thin egg-shell, thus exposing the lining membrane (serosa) to the water. Osmosis follows, and water accumulates in the amniotic cavity in front of the head and forms the "vesicle". Water continues to be swallowed, resulting in further

expansion of the head, which pushes forward until it fills the vesicle. Up till now there has been no forward movement of the embryo as a whole, but the vesicle protrudes from the pit in which the egg lies and is soon followed by the head. The pressure of the head ruptures the enclosing membranes (amnion and serosa) and the embryo slips out." It is known as the *pronymph* or prolarva, this being regarded as the 1st instar. It is somewhat pupiform in outline, since the antennae and limbs are all folded back under the body.

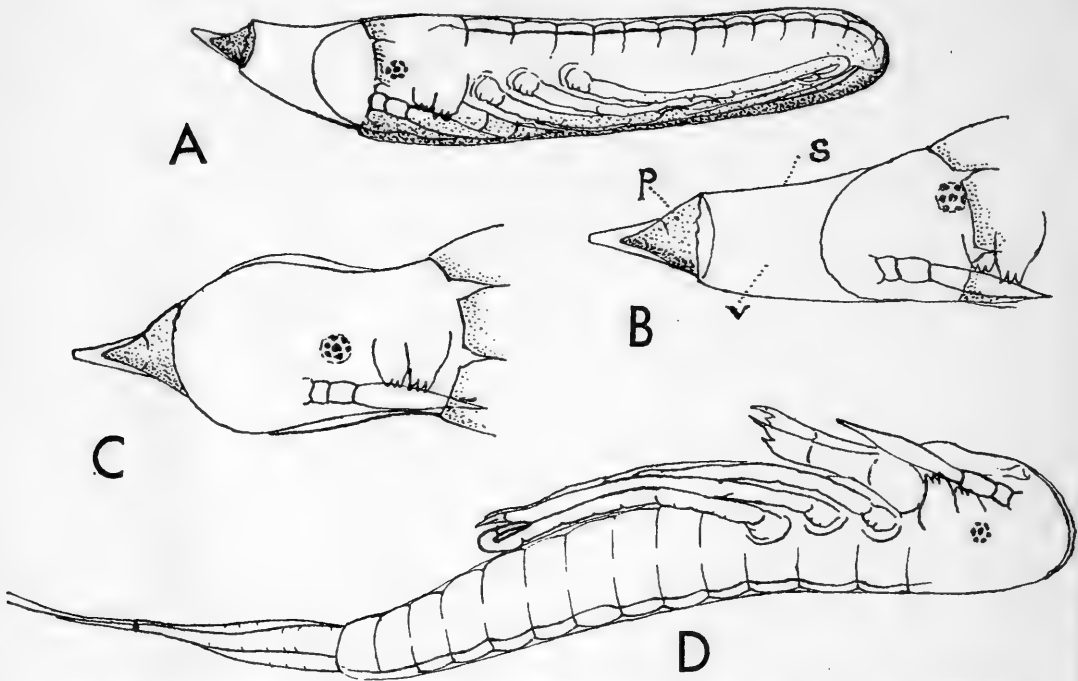


Fig. 14. Hatching of *Coenagrion scitulum* (Ramb.). A, at 9.55 a.m., egg-shell ruptured. B, 10.48 a.m., head of pro-larva beginning to move forward in vesicle. C, 10.49 a.m., head filling vesicle. At 10.51 a.m., the amnion and serosa fractured allowing the prolarva D to slip out. *p*, pedicel; *s*, serosa; *v*, vesicle

The swallowing movements become more rapid again in order to produce the pressure necessary to split the prolarval cuticle and release the free nymph or larva. The prolarval stage although always of short duration, varies in time. In *Anax papuensis* Burm., three to twenty seconds (Tillyard, 1917), *Ischnura verticalis* (Say), one minute fifteen seconds to two minutes fifty seconds (Grieve, 1937), *Sympetrum s. striolatum* (Charp.) ten minutes (Gardner, 1950a). Pierre (1904) has described the hatching of *Lestes viridis* (Van der Lind.). Eggs laid in autumn on the underside of sallow or osier stems form so called "Dragonfly-galls". The eggs hatch in the spring. The prolarva bends the body strongly and jumps clear of the stem, usually into the water. If it falls on to the ground it is able to skip vigorously, until, aided by the sloping ground, it reaches the water.



In the free or 2nd larval instar (Fig. 15) the head and legs are relatively larger than in the later stages. The eyes are small, antennae consisting of three segments and the labium simple and in setigerous species armed with one palpal and generally without premental setae. The thoracic segments are approximately equal in size, there is no indication of wing development, and the tarsi are simple. Abdominal spines are absent, also the cerci of the anal appendages. In the Anisoptera the abdominal and marginal setae of the postocular lobes are relatively long and few in number. In such species as *Brachytron pratense* (Müll.) and *Aeshna grandis* (L.) spine-like outgrowths occur below the eyes on the postocular lobes (Gardner, 1951), these become absorbed by about the 7th to the 9th instar. In *Cordulia aenea* (L.) and *Somatochlora metallica* (Van der Lind.) two obtuse spine-like outgrowths arise from the dorsal surface of the occiput (Gardner, 1954b).

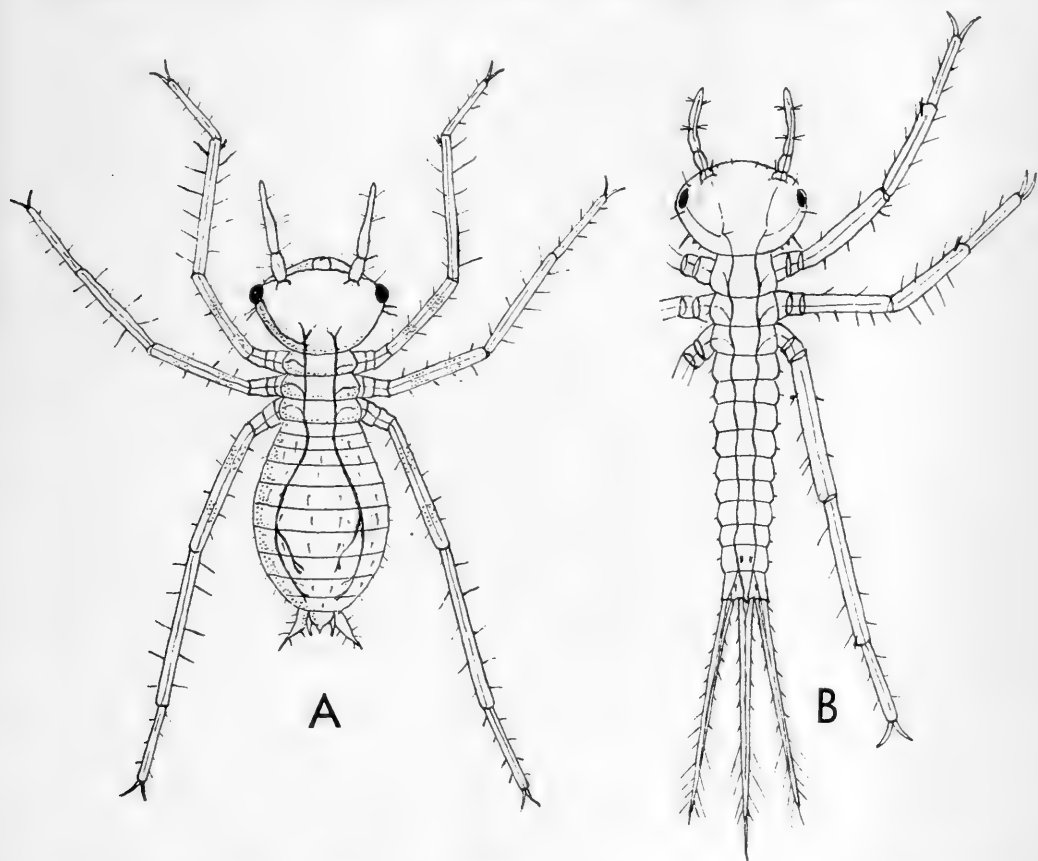


Fig. 15. 2nd instar larvae. A, *Sympetrum s. striolatum* (Charp.) (Anisoptera). B, *Pyrrhosoma nymphula* (Sulz.) (Zygoptera).

They become proportionally shorter at each instar and are absorbed in *C. aenea* by the 6th instar, but persist in *S. metallica*. The caudal lamellae of the Zygoptera are long, tubular, relatively of greater length than in later stages and with the marginal setae long and hair-like.



*Larval development:* At each successive instar the head and legs (in the Zygoptera the caudal lamellae) become relatively smaller, and generally by the 5th to 6th instar the larva begins to resemble the adult larval outline.

The compound eyes greatly increase in size, additional facets being added at each ecdysis. The ocelli are inevident until late in larval life. The antennal segments increase from three to six or seven (three to four in the GOMPHIDAE), this being brought about by the division of the basal segment of the flagellum. In *Aeshna*, *Anax* and the Zygoptera which attain the 7-segmented condition, the increase from six to seven segments is brought about by the division of the apical segment of the flagellum. Growth of the labium is marked by the more complete fusion of parts, more forward projection of the median lobe of the prementum, strengthening of the movable hooks, additional crenations on the distal margin of the labial palps, and increase in number of palpal and premental setae. Development of the labium of *Sympetrum s. striolatum* (Charp.) has been studied in detail by Corbet (1951), it being found that palpal setae may be added in two ways: (1) At the proximal end of the palpus, probably involving the migration and replacement of the subsidiary palpal seta. (2) Between pre-existing setae by restricted interpolation. The premental setae may be added by mesial and lateral additions.

Wing development is marked first by the pleural ridges which become evident at the 4th or 5th instar. At the next ecdysis the wing-sheaths show as small buds and at each ecdysis become longer, are set at a more oblique plane, and later are notable in that the hind overlap the fore. The pterothorax increases in size out of proportion with the prothorax, whilst the mesopleurae grow forward until they meet in front of the wing-sheaths.

Development of the legs is notable for the increase and strengthening of setae and the increase of tarsal segments, these ultimately consisting of three segments (two in the fore and mid-legs of the GOMPHIDAE) and like the antennal segmentation, appears constant only at generic level. At about the 5th instar abdominal spines are evident although rudimentary, the abdominal setae become progressively shorter and more numerous and the cerci of the anal appendages become evident at about the 7th instar. In the Zygoptera the caudal lamellae change from the linear to triquetral form, then by flattening laterally or dorso-ventrally form the lamellar type. The saccoid type are formed by the inflation of the triquetral stage (Tillyard, 1917).

The number of larval instars may vary from ten to sixteen, but in most species eleven to twelve appears to be the average number. Normally growth and development are correlated at each moult, but sometimes after a moult in which growth only appears to have taken place, an additional moult takes place shortly afterwards in which structural changes are evident with little or no increase in the size of the larva. The length of larval life may vary with individuals of the same species and varies greatly throughout the order, water

temperature and abundance of food being important factors in the growth and development of the larvae. Recent experiments with *Orthetrum stemmale capense* (Calvert) Gardner (unpublished) have shown that larvae kept at 85° F. can attain the 5th instar in twelve days (12th and final larval instar in fifty-one days), whereas larvae kept at 65° F. took forty-three days to attain the 5th instar. When subjected to a higher temperature they developed rapidly. *Palpopleura lucia* (Drury) form *portia* Ramb., kept at a temperature of 75° to 80° F., also exhibited rapid growth, one specimen only taking fifty-three days from hatching to the attempted emergence of the imago (Gardner, unpublished). Species such as *Lestes* which overwinter in the egg stage, hatch in early spring, and develop in temporary ponds, reach maturity in a few weeks, but generally the Zygoptera take one year to complete development.

In the Anisoptera the GOMPHIDAE, AESHNIDAE and CORDULIDAE exhibit slow development, two or three years being not uncommon, *Epiophlebia superstes* Selys (Anisozygoptera) taking probably seven or eight years to reach maturity. Corbet (1954) has shown that in Britain *Anax imperator* Leach has a diapause in the final larval instar; this is obligatory and induced by successively decreasing photoperiods.

The growth rate varies from instar to instar, also it varies for different parts at the same instar.

*Larval habits:* Dragonfly larvae breed in a wide range of habitats, slow and fast streams, all types of still water, sphagnum bogs and mere runnels. They do not, however, thrive in water which is contaminated. Many species tolerate brackish water, a notable species *Erythrodiplox berenice* Drury being found in ponds with salinity up to 170 per cent. of sea water (Pearse, 1932).

Many species have adopted a specialised mode of life, from Costa Rica the Zygopterous genus *Thaumatoneura* having several species which live only in the spray from water-falls. Also in S. America are the amazingly modified Bromeliad-dwellers, *Mecistogaster* and *Megaloprepus*. The larvae live in very constricted pockets of water at the base of the plants growing on the tree-trunks, their prey probably only consisting of insects which fall in and are trapped. In the Hawaiian *Megalagrion* some of the species breed in water collected at the bases of the leaves of *Astelia* plants. Like the Bromeliad-dwellers the caudal lamellae are short and stout. *M. oceanicum* McLach., and *M. hawaiiense* McLach., are semi-terrestrial and crawl about on the wet banks of streams, right out of water and attack prey on land. *M. oahuense* Blackb., is entirely terrestrial, living under the dense shade of thickets on the fern *Gleichenia linearis* on the mountains of Oahu. The larvae crawl about in the wet leaf-mould where also the eggs are laid. In Australia there are the archaic forms such as *Petalura gigantea* Leach which forms burrows or canals in the peat or mud of small mountain-swamps (Tillyard, 1917), and *Telephlebia g. godeffroyi* Selys which appears to possess slime glands and which prefers to live on twigs out of the water (Tillyard, 1916).

The habits of the larvae are also variable, some lurk beneath rocks, in the aquatic vegetation, the GOMPHIDAE and CORDULEGASTERIDAE burrow in the silt with only the eyes and anal appendages visible, and in such species the legs are broad and adapted for burrowing. Some species sprawl amongst the trash at the bottom of the ponds, whilst others are more active and lead a less confined existence. The 2nd instar larvae feed on *Paramoecium* and other small living organisms, they are not, however, beyond making a meal of one of their own pro-larvae (Gardner, 1950a). At the 3rd or 4th instar they prey on small Crustacea such as *Cyclops* and *Daphnia*, Chironomidae larvae and Nematocera. Later little comes amiss and they will attack tadpoles and even small fish. The Zygoptera generally live in harmony but many species of the Anisoptera, in particular the *Aeshna*, are cannibalistic and stealthily stalk each other.

*Emergence of the imago:* Several days prior to eclosion the larvae become sluggish, darker in colour, and take no food as the labium is undergoing histolysis. The mesothoracic spiracles are open, the larvae breathing air through them, in fact several species of *Aeshna* spend more time out of the water than in it. The thorax becomes greatly swollen, causing the wing-sheaths to stand vertically off from the abdomen. When the internal changes are almost completed the larvae climb up a convenient sedge or reed until they are clear of the water, the tarsal claws are firmly fixed to the support and they remain motionless for a short while until the outer surface is dry. The thorax splits mid-dorsally and the split extends forward to the eyes. First the thorax of the imago is protruded, quickly followed by the head. The legs and wings are then withdrawn. At this stage the majority of the Anisoptera hang head downwards presumably to allow the legs to harden (Plate X, Fig. 5). After this "rest" period the insect jerks itself upward and grasping the head of the exuvia or reed stem withdraws the abdomen. Elongation of the latter and expansion of the wings then follow (Plate X, Fig. 6). Some species of *Argia* and many of the GOMPHIDAE transform in either a horizontal or vertical position, on rocks, tree-trunks, etc. Many species have been found to have emerged on trees, boathouses, etc., some distance from the ground and from the water. Emergence of the Zygoptera largely takes place early in the morning. Corbet (1952) found that in *Pyrrhosoma nymphula* (Sulzer) shelter and warmth appear to be major factors influencing the choice of eclosion supports. The peak period of emergence was between 9 and 10 a.m. (B.S.T.) and unfavourable weather conditions at this time postponed emergence until the following day. As the Anisoptera are generally larger insects and take longer to harden, emergence generally takes place at night to prevent predation by birds (Plate XI, Fig. 8). The maiden flight takes place at dawn.

*Habits of Imagines:* The freshly emerged or teneral imagines are soft, the colours are not developed and flight is feeble. They make their way from water and concentrate on feeding. After a period of from one to two weeks, maturation is complete and they return to

water. The males generally arrive first and in the Anisoptera generally establish "territories" over the water (Moore, 1952). The females arrive a day or so later, copulation and oviposition taking place shortly after their arrival. Forms of courtship display are few, the male of *Agrion virgo* (L.) and *A. splendens* (Harris) settle in front of the female and raise and lower their gloriously coloured wings several times before attempting to grasp the more sombrely coloured female (Gardner, 1951). In *A. maculata* Beauv., the male displays the white ventral spot at the tip of its abdomen by curving the abdomen upward and forward, the fore-wings being held motionless, the hind-wings rapidly fluttered (Williamson, 1904). The little metallic green *Hemiphysbia mirabilis* Selys displays the long ribbon-like anal appendages to the female by raising the abdomen and bending it sideways while walking up a reed-stem. The female replies by moving the whitened tip of her abdomen from side to side. This is followed by the insects flying out from the reeds and performing a miniature "pas de deux" (Tillyard, 1913). In the African *Chlorocypha caligata* (Selys) the male tibiae are flattened, the outer surface vermilion and the inner surface white in colour. The male swings in flight pendulum-fashion in a semi-circle round the female, the white surfaces of the tibiae being brought together under the head in front of the female (Pinhey, 1951). Generally, however, the males pounce on the females in no uncertain manner, the anal appendages being used to grasp the head of the female (Anisoptera) or her prothorax (Zygoptera). As previously explained the female curves her abdomen upwards to bring her genitalia into contact with the accessory genitalia of the male. Copulation may take place in the air whilst the couple are flying in tandem, at rest on vegetation or on the ground.

Most of the Zygoptera oviposit in tandem (Plate XIII, Figs. 12, 13). In the Anisoptera, however, the male releases the female (excepting some LIBELLULIDAE, notably *Sympetrum*), but often hovers near whilst the female is ovipositing.

The Zygoptera and PETALURIDAE and AESHNIDAE of the Anisoptera which have well-developed ovipositors practise endophytic oviposition. The eggs are inserted in the tissues of plants above or below the surface of the water, in floating trash, rotting wood or in moss bordering the water. The eggs may be placed irregularly, in oblique or concentric rows, a single egg placed in each puncture or several. *Aeshna constricta* Say deposits her eggs in the stems of the Sweet-flag *Acorus calamus* L., two feet above the water (Walker, 1953). *A. mixta* Latr., similarly inserts her eggs above the water in the stems and leaves of the Great Reed Mace and Branched Burr Reed. In the latter species it is known that the eggs do not hatch until the autumn gales have broken up and submerged the plants (Gardner, 1950b). Many species of *Lestes* oviposit in emergent plants, Needham (1900) noting considerable damage to the stems of the Blue Flag (*Iris versicolor* L.). *Selysionneura cornelia* Lieftinck from New Guinea oviposits in the midrib and nerves

of some broad-leaved trees (Lieftinck, 1953). Most species observed ovipositing in aquatic plants work backward and downward, and in many species the female often accompanied by the male is totally submerged for half an hour or more.

Exophytic oviposition is correlated with species which possess reduced or rudimentary ovipositors. In many species of the CORDULEGASTERIDAE the ovipositor is degenerate and formed into a long awl-like organ, the females hovering over the shallows of streams and driving their ovipositor vertically into the mud. Fraser (1952) records a female "hovering with her abdomen held vertically and rising and falling with clock-like regularity". This author records 89 such dipplings in the same patch of mud. *Somatochlora metallica* (Van der Lind.) uses her strong and pointed vulvar scale as a pick, the eggs being inserted in wet mud or soil often beyond and above the water's edge. In those species which possess reduced ovipositors the eggs are generally exuded in a mass and are washed off by the female striking the surface with the tip of her abdomen. The GOMPHIDAE invariably oviposit by the female swiftly skimming over shallow streams, the eggs being discarded by flipping the summit of one of the ripples with the end of her abdomen (Fraser, 1952). *Libellula pulchella* Drury rhythmically taps the water about four times per second, always rising between strokes to about five inches (Walker, 1953). In *Hydrobasileus croceus* (Brauer) the male releases the female which dips like lightning to the water, washes off her eggs, and on rising is immediately and unerringly seized by the male (Fraser, 1952). Some species wipe off the eggs on wet sphagnum and moss, *Tetrathemis* exude a mass of eggs on leaves above the water, whilst in the *Tetragoneuria* the eggs are exuded in long gelatinous strings, these swelling into rope-like clusters in the water.

After ovipositing the female Anisopterous dragonflies tend to leave the water; males generally persist and continue to hawk after prey during favourable weather conditions. Most species are active in sunshine, they disappear to sheltered parts in strong wind, but may remain active on dull days if there is no appreciable drop in temperature (Moore, 1952). The Zygoptera tend to form colonies and are generally found close to their breeding haunts. Here both sexes fly among the foliage bordering the water, their flight not long sustained, resting on sedges, etc., to devour prey which they have caught, and in dull weather going deeply into the tangle of grass and sedge. *Coenagrion armatum* (Charp.) flies low over the water in and out of the reeds, a habit shared by *Nehalennia*, *Amphiagrion*, and *Anomalagrion*. The little *Nannothemis bella* Uhler, the smallest Canadian libellulid, likewise, rarely flies more than a few inches above the sphagnum of its bog habitat (Walker, 1953). The beautiful AGRIIDAE generally fly up and down streams, their flight being butterfly-like, many *Lestes* are frequently found some distance from water, whilst female *Pseudagrion massaicum* Sjöstedt spend long periods hiding among the bushes and trees.

In the more powerful Anisoptera the habits vary greatly, the GOMPHIDAE generally flying low over streams, making rapid and short flights and resting on rocks or the bare ground, the wings held horizontally poised for instant flight. Many CORDULIIDAE fly at a considerable height and perform amazing aerobatics. The LIBELLULIDAE generally fly near the ground, rest frequently and return again and again to a favourite twig or reed. *Tramea* and *Pantala* have a tireless flight, gliding in a lazy fashion which is deceptive to the collector. Both the African *Zygonyx torrida* (Kirby) and *natalensis* (Martin) fly in the spray of rapids and waterfalls. Generally the AESHNIDAE have a strong steady flight, hawking up and down their favourite beat in tireless fashion, occasionally darting at an intruder who has trespassed on their territory. When in repose they hang up by the legs in a bush or tree, this giving them concealment, but a position unsuitable for a rapid take-off. Many species of *Aeshna* remain on the wing until dusk. Several species are crepuscular, perhaps the most notable being the tropical and neotropical *Gynacantha*. Hiding during the day in thickets and bamboo, they appear on the wing well after dusk and prey on mosquitoes and microlepidoptera. *G. hyalina* Selys being frequently taken at light in bungalows (Fraser, 1936).

Specialised feeding habits are rare. *Hagenius brevistylus* Selys habitually preys on smaller dragonflies, *Neurocordulia yamaskanensis* (Provancher) flying only during dusk and preying on large mayflies of the genus *Hexagenia* which are on the wing at the same time (Walker, 1953). Generally, however, any small insect on the wing is liable to be captured. Caddis-flies and Diptera probably form the bulk of their prey, mosquitoes are frequently devoured in vast numbers, dragonflies, therefore, proving beneficial in addition to colourful denizens of the countryside.

**Migration:** Many species exhibit strong migratory instincts, (Fraser, 1954a) stating that species of *Pantala* (Plate X, Fig. 7) and *Tramea*, during September, "pass out from Ceylon and the Western Ghats of India in a ceaseless stream of never-ending millions, and none return". The British Isles have been invaded many times, *Libellula quadrimaculata* L., *Sympetrum s. striolatum* (Charp.), *S. flaveolum* (L.) and *S. fonscolombeii* (Selys) being the most notable species. Longfield (1948) describes an invasion of the south coast of Ireland by *Sympetrum s. striolatum* between mid-August and mid-September, 1947. Vast swarms came in from the sea in narrow columns and were inclined to spread out on reaching the land. From recent evidence it appears that some species migrate during the night. *Sympetrum flaveolum* was taken in a mothtrap at Dover (Longfield, 1954), and in September, 1954, quantities of *S. danae* (Sulz.) appeared with the Silver Y moth *Plusia gamma* (L.) at Tory Island Lighthouse, N.W. Ireland (Baynes, 1954, *in litt.*).

**Enemies:** Apart from predation from near relatives the larvae have many enemies. Aquatic Hemiptera, *Dytiscus* larvae, frogs, aquatic



birds and many species of fish all take their toll. The imagines are preyed on by ants, frogs and birds while in the teneral stage. Later many fall prey to wasps, robber flies (*Asilidae*), frogs, lizards, snakes and birds. Of the latter, kingfishers, swifts, swallows and hawks are expert hunters. Many Zygoptera are ensnared in the webs of spiders (Le Gros, 1953) or by the sticky leaves of sun-dews (*Drosera*).

*Parasites*: The Hymenopterous MYMARIDAE or "fairy-flies" which swim under water by means of their wings have been described as ovipositing in the eggs of endophytic species. The larvae are attacked by internal parasites such as Sporozoa, Trematoda and Nematoda. External parasites such as the HYDRACHNIDAE or water-mites are found on many larvae breeding in still water. The mites are carried into the air when the larva emerges, migrate from the exuvia to the dragonfly and settle on one of the soft infoldings of the body wall for a period of three or four weeks. Small flies of the family CERATOPOGONIDAE are also parasitic by sucking the blood from the wings of dragonflies.

*Hibernation*: The European *Sympecna fusca* (Van der Lind.) hibernates in the imaginal stage as do the Australian species *Diplacodes bipuncta* (Brauer) and *Austrolestes leda* (Selys) also, though the winter there is short and mild. Apart from these interesting exceptions, the normal length of life of the adult is probably from three to five weeks, the duration being greatly affected by adverse weather conditions.

The author is fully aware that many interesting facts have been omitted and structural details inadequately described in this paper. Space, however, would not permit greater attention to detail. Much information has been gleaned from the works of Fraser, Tillyard and Walker, odonatists who have contributed so much to our knowledge of these beautiful and interesting insects.

#### ACKNOWLEDGMENTS.

I am indebted to Miss C. Longfield for information regarding the habits of the *Megalagrion* larvae; to Mr. S. Beaufoy, Dr. P. S. Corbet and Col. Niall MacNeill for kindly allowing me to reproduce their photographs; also to Dr. Corbet for the privilege of reading his manuscript on the life-history of *Anax imperator*, and for permission to quote facts and reproduce his drawing of the egg. Many illustrations have been reproduced by kind permission of the Editor of the *Entomologist's Gazette*. The photograph of *Pantala flavescens* is from a specimen kindly given me by Lt. Col. F. C. Fraser.

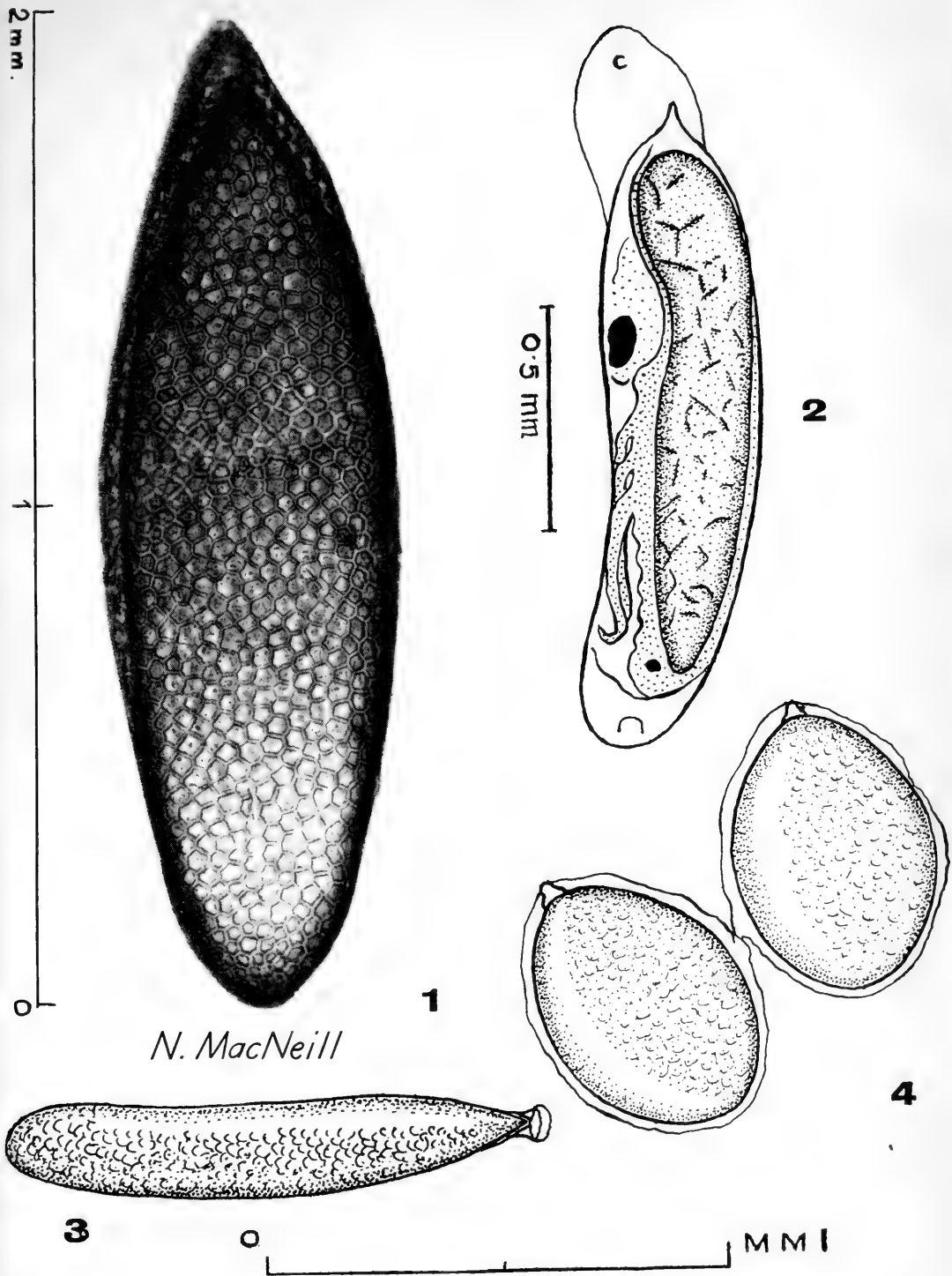
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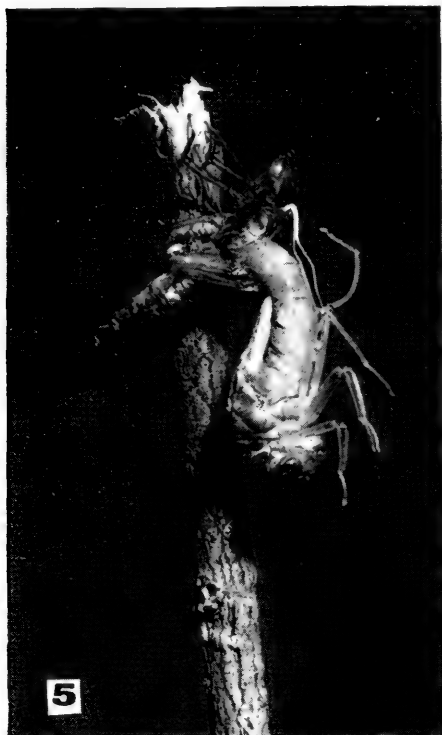
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Eggs of Dragonflies. 1, *Aeshna cyanea* (Müll.). 2, *Anax imperator* Leach shortly before hatching. c. cone of tissue (After Corbet). 3, *Coenagrion hastulatum* (Charp.). 4, *Leucorrhinia dubia* (Van der Lind.).



*S. Beaufoy.*

*P. S. Corbet.*

*Anax imperator* Leach. 5, Imago emerging and in "rest" position. 6, A later stage showing wings and abdomen expanding.

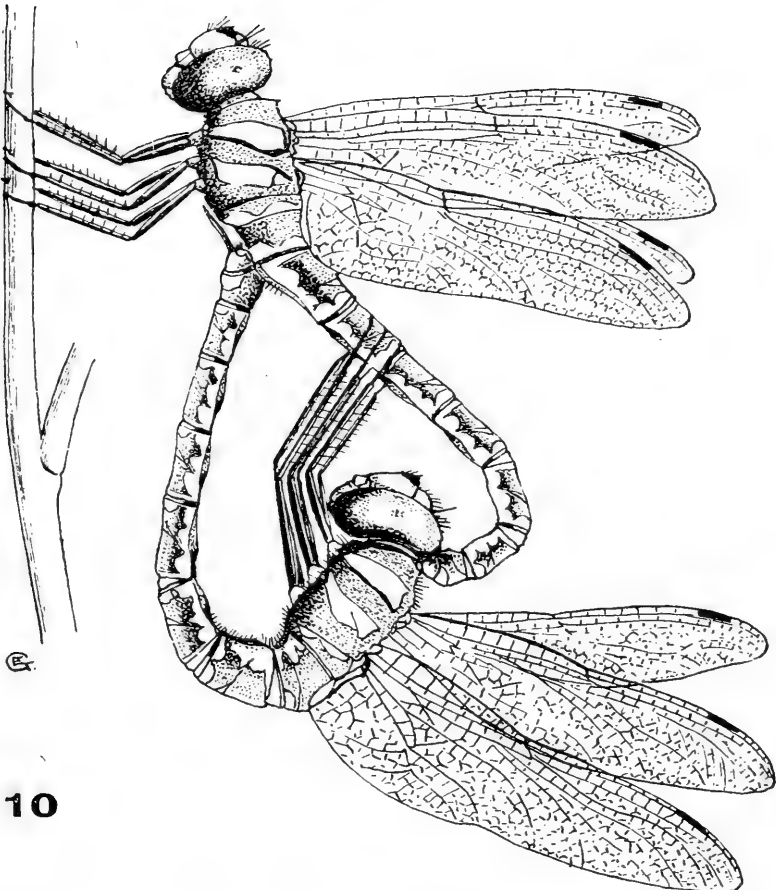


7, *Pantala flavescens* Fabr. A circumtropical and notable migrant species.



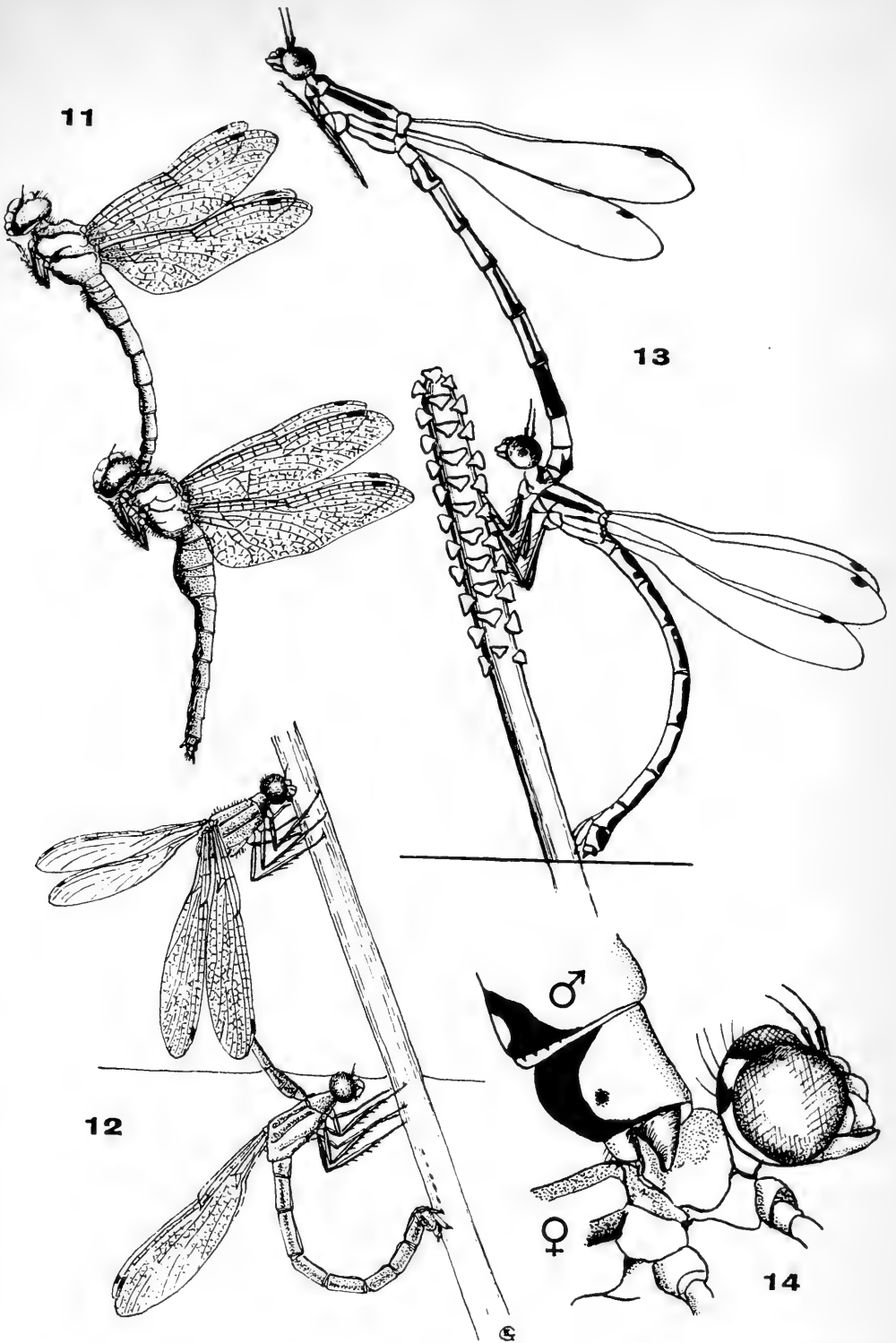
S. Beaufoy.

8, A group of newly emerged adult *Anax imperator* Leach. Time just before dawn and prior to maiden flight. The 'Fish Pond', Wokefield Common, Berks., May 1953.



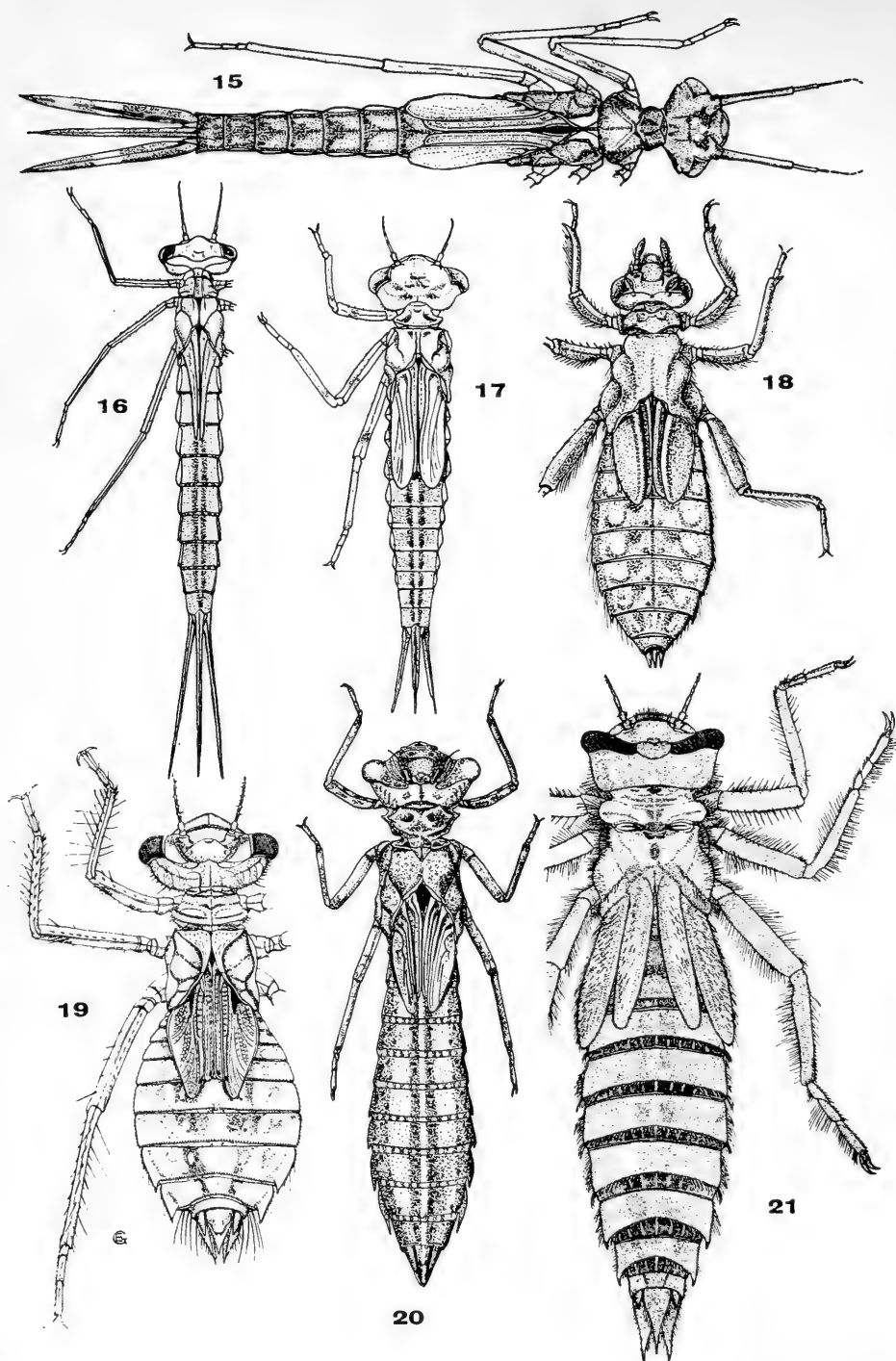
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*Aeshna juncea* (L.). 9, Male transferring sperm capsules to the accessory genitalia whilst in flight. 10, Male and female in copula.



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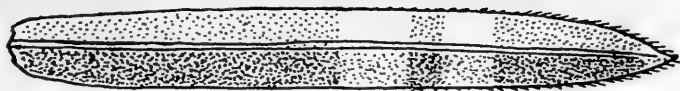
11, *Sympetrum s. striolatum* (Charp.). Male and female flying in tandem. 12, *Lestes sponsa* (Hanse.). Female inserting eggs in a reed under water whilst held by the male. 13, *Coenagrion puella* (L.). Pair ovipositing above water. 14, *C. puella*. Showing male anal appendages gripping posterior lobe of female prothorax.



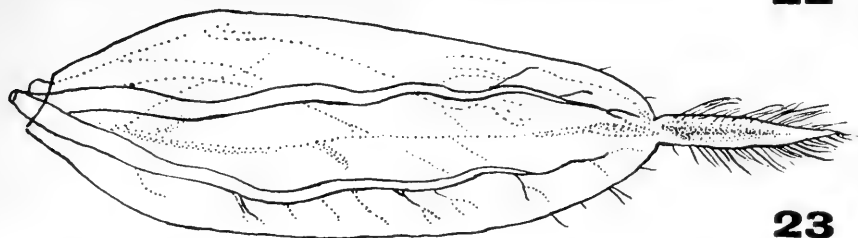
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Dragonfly larvae. Zygoptera. 15, *Agrion virgo* (L.). 16, *Lestes dryas* Kirby (After MacNeill). 17, *Coenagrion mercuriale* (Charp.). Anisoptera. 18, *Gomphus vulgatissimus* (L.). 19, *Leucorrhinia dubia* (Van der Lind.). 20, *Brachytron pratense* (Müll.). 21, *Cordulegaster boltoni* (Don.) (After MacNeill).

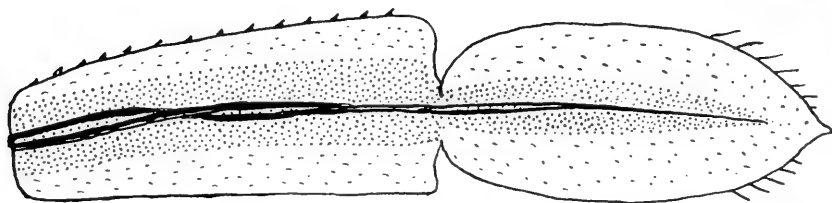
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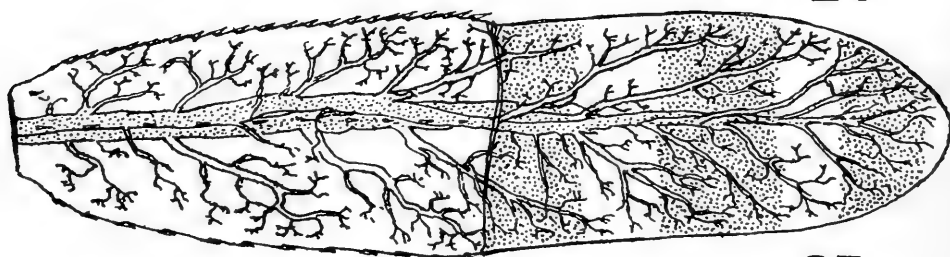
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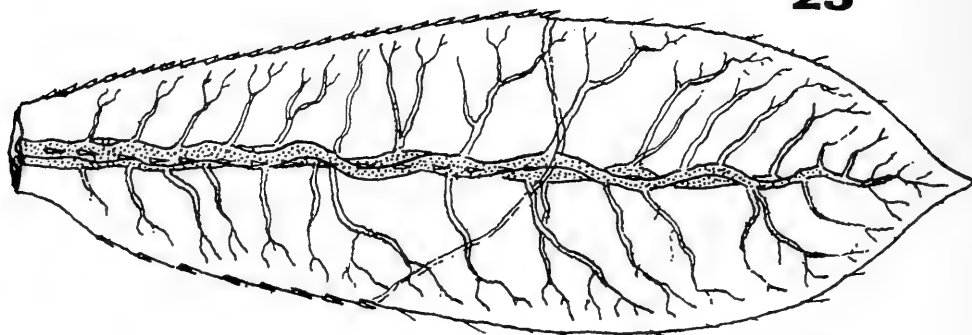
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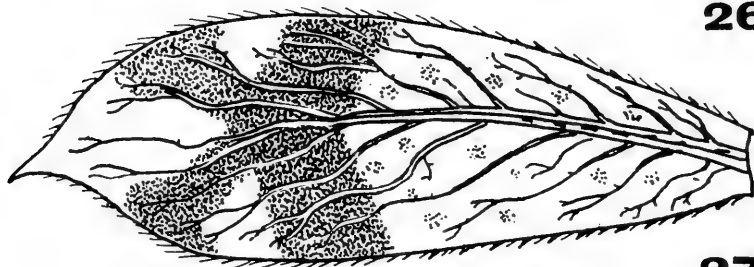
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A. E. Gardner del.

Types of caudal lamellae. 22, Triquetral. *Agrion splendens* (Harris). 23, Constricted saccoid. *Selysioneura cornelia* Lieftinck (After Lieftinck). 24, Constricted lamella. *Isosticta simplex* Martin (After Tillyard). 25, Nodate lamella. *Erythromma najas* (Hanse.). 26, Subnodate lamella, *Coenagrion scitulum* (Ramb.).

27, Denodate lamella, *Pyrrhosoma nymphula* (Sulz.).

Not to same scale.





# HYBRIDS WITHIN THE EUROPEAN *PIERIS NAPI* L. SPECIES-GROUP

(Lep., Pieridae).

By S. R. BOWDEN, B.Sc., A.R.C.S., F.R.E.S.

Read 28th April, 1954.

## ABSTRACT.

Repetition and elaboration of the frequently quoted experiments made by Hugh Main 45 years ago have shown that hybrids obtained from *bryoniae* ♀ × *napi* ♂ and those from *napi* ♀ × *bryoniae* ♂ are similar. Main's complex results, which would lead to a contrary conclusion, can be attributed to the accidental inclusion in the experiments of a "*bryoniae*" male genetically indistinguishable from *napi*.

Hybrid pairings have easily been obtained and F.1 and F.2 hybrids reared, though fertility appears to be reduced in the F.2. It has not proved possible to obtain F.3 hybrids, but F.2 males are fertile with *bryoniae*. The results support the contention that *P. bryoniae* is a good species, but that gene-exchange with *P. napi* can take place.

In the hybrid females both *bryoniae* marking characters and "*flava*" colour persists in the F.1, though to a very variable extent. In the F.2 these are seen to be inherited independently. The simple recessive forms *sulphurea* Schöyen and "*albino*" are inherited as in *napi*. The beautiful forms obtained in the F.1 by using f. *sulphurea* as the male parent probably derive not from the *sulphurea* gene but from "*banding*" genes associated with it.

Hybrids obtained from other subspecies have included *flavescens* × *bryoniae* (F.1 and F.2), *adalwinda* × *neobryoniae* (F.1 and F.2), *adalwinda* × *bryoniae* (F.1) and *adalwinda* × *napi* (F.1). Descriptions of some of these are given.

The relationships of the subspecies are discussed.

Having come rather late in life to breeding butterflies, I took up *Pieris napi* only with the vague idea of practising on something easy and readily available. By this time, 1945, Mr. J. Antony Thompson seemed to have established a virtual monopoly of *napi* and it seemed both presumptuous to trespass on his field and also highly unlikely that I could do so to good effect.

So I spent about three years learning by my many failures, with *napi* gradually increasing its hold on me. In old volumes of *The Entomologist*, borrowed from the Society's library, I read of the peculiarities of an Alpine variety called *bryoniae* Ochseneimer. Visits to the European collections of the British Museum (Natural History) at South Kensington showed me not only *bryoniae* from many localities but also a series of hybrids with British *napi*, bred forty years before by

Mr. Hugh Main. In a sale-room I saw, and unfortunately failed to buy, a copy of Müller and Kautz's monograph (1938). Later Mr. Syms kindly lent me his copy, and it has been in my hands for the greater part of the last four years. "Müller and Kautz", despite Mr. Thompson's unfavourable reference to it (1947), is in fact indispensable, and I have laboriously translated much of it into very peculiar English. This is not the place to attempt an appraisal of their work as a whole, but Müller and Kautz did devote a great deal of space to arguments for the full specific separation of *bryoniae* from *napi*.

Until comparatively recently *bryoniae*, whether from the Alps or from the Arctic circle, was generally regarded as merely a geographically limited variety of *P. napi*. The males are almost indistinguishable from those of *napi* and the genitalia appear identical (Sterneck, quoted by Müller and Kautz, 1938: 162). In typical *bryoniae* females on the other hand the dark markings on the upperside are more extensively developed than in *napi*, are often rather brown in tone and tend to be lost in a smoky "suffusion" of dark scales, especially on the forewings. The background colour, where it is visible, is ochre, that is, a slightly brownish yellow.

Here I should mention the dark mark that I call the bryo-streak, which extends from the centre of the lower forewing spot to the outer margin. The value of this streak as a diagnostic character for *bryoniae* was pointed out to me by Herr Gerhard Hesselbarth; it is rare in typical *napi* though it occurs commonly in *adalwinda* Fruhstorfer ("northern *bryoniae*") and probably in the other Scandinavian subspecies, *bicolorata* Petersen—also Mr. N. T. Easton has it well developed in specimens that he bred from Donegal × Aberdeen stock. Probably the development of some other unit of the dark marking could equally well have been adopted as a criterion.

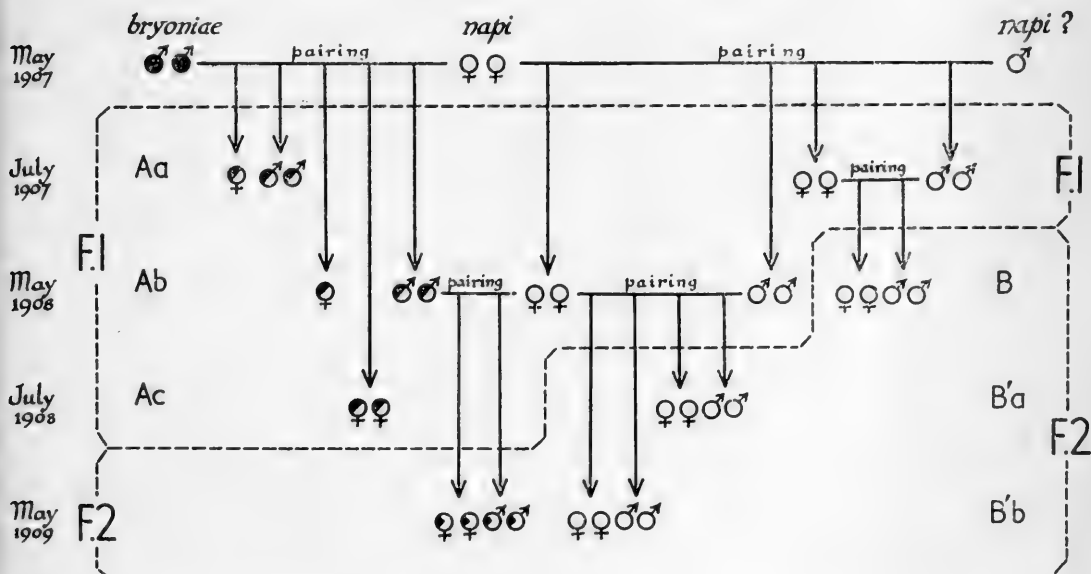
Müller and Kautz argued that the single-brooded typical *bryoniae* of Switzerland, together with the double-brooded *flavescens* Wagner from near Vienna and *neobryoniae* Sheljuzhko from the southern Alps, formed a distinct species. Nevertheless none of the arguments, considered singly, was convincing: in particular, the argument from hybrid infertility seemed to be inadequately supported. The lamentable results of Kautz's own crossing experiments (1938: 159, 174) I attributed to faulty technique, which must have been unjust, for in fact Kautz has raised something like 250 broods of *napi* and *bryoniae* over a period of forty years. Main's F.2 brood had appeared to be large and healthy; his failure to get an F.3 proved little, it seemed to me, for had not I myself twice failed to keep even Head's variety going for more than two generations?

#### MR. HUGH MAIN'S HYBRIDS.

Main's results were in fact very peculiar. He and Mr. A. Harrison obtained *bryoniae* stock from Switzerland and raised F.1 hybrids with British insects on two occasions. In 1907 males bred in a variable batch of Kleine Scheidegg Pass *bryoniae* were paired with English *napi*

females from Cornwall; in 1908 a female bred from Simplon Pass *bryoniae* was paired with a Scottish male (Harrison and Main, 1909). The specimens resulting from the Simplon Pass hybridization are at South Kensington, but the specimens from the Kleine Scheidegg cross were not presented at that time and after Main's death passed to Mr. Syms, who recently transferred them very kindly to me.

The Simplon hybrids, from *bryoniae* ♀ × Scottish ♂, do indeed look very much as one would expect in view of the cumulative inheritance usually attributed both to dark markings and to ochre ground. The males are of course white and in practice indistinguishable from *napi*: even for *bryoniae* itself the distinction of the males is uncertain except in series. The two females from the over-wintering hybrid pupae are intermediate in markings between "spring-brood" *napi* and single-brooded *bryoniae*, having radiated black markings on a ground-colour approaching white. The "suffusion" of dark scales on the forewings is considerable, greater than in the usual spring form of the Austrian *P. bryoniae flavescens* Wagner but less than in typical *bryoniae*. The fifteen females which emerged the previous July ought to be compared with the summer generation rarely obtained in *P. bryoniae bryoniae*; the females of this differ from the typical form in the same way as that in which *napi* summer-generation females differ from the spring generation: that is, the spots are more pronounced, the radiating markings much less so; nevertheless in summer *bryoniae* the general smoky appearance of scattered dark scales on the ochre background is retained.



HUGH MAIN'S HYBRIDS, "*P. bryoniae* ♂ × *P. napi* ♀"

Lettering according to Main

The summer hybrids, then, nearly all resemble this summer *bryoniae*, but are generally rather less heavily marked on a paler ochre background. The "suffusion" with dark scales is again much less than in *bryoniae*, but greater than in the summer form of *bryoniae flavescens*. Two of the females approach *P. napi* var. *flava* Kane in appearance, but these still have the bryo-streak definitely and are the darkest ochre of the whole series. The hindwings all have the central spot belonging to the so-called *fasciata* band (and even the spring females have a suggestion of it).

The hybrids from the reciprocal cross, *bryoniae* ♂♂ × Cornish ♀♀, are a very different story. Main's words are: "Most of these insects were quite typical *napi*, only one specimen which emerged in 1907, and the fifteen which emerged in the summer [June and July] of 1908, showing any approach towards the form *bryoniae*, and these are much nearer to *napi* than to *bryoniae*". While the brood has been in my possession it has been possible for me to judge how far Main's description is justified. It is in fact almost entirely correct, except for its final phrase. Taking the bryo-streak as an indicator of *bryoniae* characters (which it is fairly safe to do when only southern English *napi* is in question) there are possibly vestigial traces of *bryoniae* in two of the spring females, but I should be prepared to neglect these. One other spring female (emerged 9/5/08) has a slight but definite bryo-streak and shows more than the usual grey-black "suffusion" on the forewings; moreover the ground-colour is very faintly ochreous. The 1 + 15 females considered by Main to approach *bryoniae* are larger than average and not only all show the bryo-streak but also possess (and apart from the May female just mentioned are alone in possessing) to a varying extent the ochreous ground-colour and "suffusion" of dusky scales characteristic of *bryoniae*; all these characters are certainly much less intense than in typical *bryoniae*, but the insects would pass possibly as a sub-species of *bryoniae* whereas they could not in my opinion be mistaken for *napi*.

Now Main (1908) described the females of his Kleine Scheidegg *bryoniae* stock as showing a considerable amount of variation. "Some had no yellow in the ground-colour, and in these the black markings varied very much. One specimen in brood B had almost obscured grey scales, similar to those at the base of the wings in the females of English *napi* . . . spread over the whole surface of the primaries, and giving an almost unicolorous effect. A specimen in brood C was very similar to some of the British examples". Twenty-two of these females are at South Kensington. The stock must have included also many males with less than the usual complement of genes for *flava* background, extensive markings and dusky "suffusion". Such males must have been concerned in the production of these hybrids and at least one, I think, must have been genetically indistinguishable from *napi* if it was not indeed a *napi* waif. The one 1907 female and the fifteen which emerged late after over-wintering conformed with expectation

both in appearance and in delayed emergence (Bowden, 1954a), but the remainder did so in neither respect. Were not the *napi*-like females in fact pure *napi*?

At first it appears that this will not quite do, because Main raised F.2 broods by pairing the *napi*-like F.1 *inter se* both in the summer of 1907 and in the spring of 1908. The F.2 females from the 1907 pairings included only one with a slight bryo-streak (perhaps negligible), otherwise appearing pure *napi*, but two of the eight F.2 females emerging in 1909 from the pairings in the spring of 1908 showed definite bryo-streaks and one of these had a slightly ochreous background colour. The explanation may lie in the simultaneous emergence of the *napi* males and females and truly hybrid males in April and May 1908, before that of the truly hybrid females in June and July. The "F.2" is then not a true hybrid F.2, but a back-cross to *napi* possibly mixed with pure *napi*.

This explanation, true or mistaken, is reached in the light of our later experiments and did not occur to Main. He felt obliged to conclude (1909) that "the *bryoniae* characters are not transmitted by the male, but are transmitted in an exaggerated degree by the female . . . the practical disappearance of *bryoniae* characters when crossing a male with British *napi* is so unexpected that it needs confirmation".

I believe Main was never able to carry out to his satisfaction the repeat experiments that he desired. I possess a few of his specimens derived from crossings in 1911 which seem not to have been too successful. Of these, three males and three females are from Swiss (Binn) ♀♀ × Scottish ♂♂ (Forres, Aviemore and Fife), the females being certainly hybrids; there is also one white female marked as from Forres ♀ × Binn ♂, which looks like pure *napi* and is possibly a waif. Main remained convinced that the inheritance of *bryoniae* characters passed almost entirely through the female. Mr. Easton tells me that Main expressed this view to him as late as 1947, and thus aroused his interest in the problem. Dr. Cockayne, when I spoke to him after my first summer's work, was well aware of the question posed by Main's findings, and it would seem extraordinary that no one for the following thirty to forty years carried out adequate experiments in such a promising field. The experiments quoted by Müller and Kautz (1938: 12) are almost negligible in this connection: Fischer had to resort to back-crossing his F.1 (*napi* ♂ × *bryoniae* ♀) with *napi*, and reported, "The combination *bryoniae* ♂ × *napi* ♀ yielded astonishingly unfavourable results and only males", so that no light at all was thrown on Main's corresponding brood.

#### NEW HYBRIDS, *P. NAPI* × *BRYONIAE*

I planned to repeat Main's experiments using Head's form, *citrona* Frohawk or *hibernica* Schmidt, now once more to be known as *sulphurea* Schöyen, as the *napi* parent. The F.2 hybrids, if I succeeded in producing them, should then include one-quarter homozygous *sulphurea*.

This would be amusing to do in any case, but I could also fairly hope to add to the evidence, one way or the other, on the specific separation of *bryoniae*. If I could breed the hybrids indefinitely, and if I could transfer the variety *sulphurea* to the hybrids and still find it behaving as a recessive, there would be something for me to say against specific separation. You may think this a little childish, and perhaps it was.

The first step was to obtain *bryoniae* stock, preferably the typical subspecies *P. bryoniae bryoniae*. Here I was extremely fortunate. My friend Mr. H. G. Short was corresponding with several entomologists in Germany and Switzerland, and they developed a desire for Head's form just as I began to think it was time that I made a start with *bryoniae*. In 1948 and 1949 Mr. Short and I bred respectable numbers of *napi* form *sulphurea* for export and early in 1950 I at last received six pupae of Engelbergertal (Swiss) *bryoniae* from Herr Hesselbarth. One was damaged and one ultimately turned out to be a *napi* waif.

With such small numbers I could not afford to let any emerge until there was a good chance of successful pairing. I had previously found with *napi* that success in spring was very much a matter of chance, so I decided to hold these pupae back till June. I have described elsewhere (1953) how I kept them in an ice-chest and obtained a pairing which enabled me to rear a stock adequate in numbers for beginning hybridizing in the following year, 1951. Later on, cold storage of pupae enabled me to attempt any desired pairings over and over again at almost any time that I chose. I am certain that with my limited time and resources I should not have got very far without a stock of pupae in the cold store; hybrid broods are inclined to be unreliable in several ways and you need all the tricks that you can muster to get the better of them even for two generations.

I should mention that the Engelbergertal stock (bred originally by Herr L. Leidenbach of Lucerne) has in my hands remained entirely single-brooded to the present time and has never produced a green pupa among 184 bone-coloured ones (Bowden, 1952). From the statements of others, including Hesselbarth (1952) it would appear that some stocks which are single-brooded in the mountains become partly double-brooded at lower altitudes. This may be important when diapause irregularities in the hybrids have to be considered. My stock is in other respects also quite typical of *bryoniae*, the females being heavily "smoked" and always yellow in ground-colour (except, of course, on the disc of the forewing underside). On the forewings the tint is ochre, but the hindwings are usually more delicately and purely coloured. The white-underside variety *subtalba* Schima, which occurs particularly among males in some *bryoniae* localities, is not represented. *Bryoniae* females white on the upperside occur, even in the Swiss Alps, but have never appeared in my stock unless one should be counted in which the damaged portion of a crippled wing had white scales.

The normal yellow ground-colour may be genetically nearly identical (as it must be chemically) with the ochre of British var. *flava* Kane.



I hoped to investigate this, and may still do so one day, if I can obtain *flava* stock. The trouble about breeding a cumulative sex-limited variety like *flava* is that you never know what your male carries, so that a line with quite good ochre females may become very pale again through the unfortunate use of a male with very little *flava* in him. Multilinear breeding is thus essential. In typical *bryoniae* stock, on the other hand, all the males ought to be full *flava* so that the daughters of *bryoniae* ♂ × *napi* f. *flava* ♀ should all be at least as dark as their mother. Kane himself wished to extend "*flava*" to all yellow females of *napi*, including *bryoniae*. This seems to be taxonomically impossible, but it is convenient to use the name for the *flava*-like colour that one meets in *bryoniae* and its hybrids.

In 1951, then, I began raising hybrid broods. When a stock becomes infertile after breeding for two or three generations, it may do so (apart from mismanagement) *either* because it is too closely inbred *or* because the original parents are so far apart, genetically, as to belong to different species. The failure of many earlier attempts to rear F.2 and F.3 hybrids might be due rather to inbreeding than to specific separation of the parents. Hesselbarth (1952) attributes his failure to obtain F.2 hybrids to a sensitiveness of *P. napi* to inbreeding. It is now clear that the matter is by no means so simple, but I in 1951 raised many separate F.1 broods with this in mind: six with the *bryoniae* parent female and three using *bryoniae* males. In most of these the *napi* was of the form *sulphurea*; in one case the *napi* male was albino as well as *sulphurea*. A *sulphurea* heterozygote male and a wild-type Hertfordshire male were also used.

I do not think ease of pairing differed significantly among any of these from that usually found with *napi*. Everything depended on the weather, a high shade temperature almost guaranteeing success. Many of my failures occurred in spring, in untrustworthy weather. Except at week-ends, I was able to observe only a few of the pairings which took place. Pairings did not ensure fertility, though I fear this is also true of pairings within British *P. napi*. In addition to the nine successful broods (using more than one female in three cases) I failed to obtain fertile eggs in thirteen other cagings in which I used 26 females, although among these I saw four pairings.

I am afraid that my pairing methods were disgracefully out-of-date, depending upon waiting till the insects reached a suitable frame of mind. Artificial methods, using clamped females and stunned males, or even detached abdomina (Lorkovič, 1952), were not employed. I used boxes with Windolite tops and with sides covered with cotton net, containing jars of cut flowers and various food-plants either potted or in water. Continuous sunshine was naturally soon fatal, especially to the males; my preference was for dappled shade under trees. Most of my cages were of about six cubic feet total capacity, but the smaller ones were perhaps even better. All sorts of pairing cages have their advantages and I make no special claims for mine.



I do not propose to trouble you with the full numerical details of my breeding. Those relating to British *Pieris napi* × Swiss *P. bryoniae* I have tabulated, for publication if our Editor wills. A deficiency in one respect will be criticised, and justly: the eggs are neither accurately numbered nor properly accounted for. Thus there is no distinction between eggs that were not fertilized, eggs containing embryos that found life too difficult, and eggs eaten by earwigs introduced with flowers. Mr. Easton is convinced, too, that many of my newly hatched larvae have eaten more than their own eggshells. Some may miss a full treatment of the numerical data with modern statistical technique, but it really would not be justified. Not only were the numbers small, but also separate experiments which it might be desired to compare were often made in varying conditions, so that the apparent precision of statistical methods might be misleading.

The larvae of *bryoniae* and the hybrids resemble closely those of *napi* and in captivity they enjoy the same food-plants: *Alliaria petiolata*, *Hesperis matronalis*, *Nasturtium officinale* and *Armoracia rusticana* (though these last two have disadvantages for the breeder). Contrary to some statements that I have seen, they seem no more and no less liable to disease in the strict sense than *napi*. I have used all kinds of receptacles for my larvae, except proper rearing cages, and at present strongly favour a flat round tin, 10½ inches in diameter and 1½ inches high, used by photographic manufacturers to send out cinema film; this is covered with its own lid when the larvae are small and later with cotton material or netting. A disc of filter-paper in the bottom is changed when it becomes damp. When washing tins and net covers I use a disinfectant.

My nine F.1 broods produced an average of over 50 pupae each. The *bryoniae* parents were from entirely single-brooded stock, but the *napi* were not. Accordingly some of the broods produced butterflies the same summer. On this aspect of the matter, and particularly the curious early preponderance of females in certain broods, a first report has appeared in *The Entomologist* (1954a), and I have resolved not to try to deal with it here.\*

A male and a female hybrid from brood 1951-γ, fathered by wild-type *napi*, paired at once but produced few eggs; these apparently began development but failed to hatch. A pairing also took place, presumably, between a male and a female of brood 1951-β fathered by a *sulphurea* heterozygote; a good batch of eggs resulted but though some seemed to have developed an embryo many were obviously infertile and none hatched. However, a female of β paired with a γ male produced an F.2 hybrid brood 1951-ν of over 100 pupae, of which four males and one female emerged the same autumn. This was quite encouraging, though there was a warning in those dead embryos.

In April and again in August 1952 I used this F.2 brood ν, the only one available at that time, to try for an F.3. I used a total of six males and three females (one female lived for 54 days). One pairing was seen,

\*See, however, Bowden and Easton, 1955.

but this female laid only one egg, which was apparently infertile. The other two laid large numbers, but only one caterpillar appeared and as this produced a white male I should not like to guarantee its authenticity.

In the summer of 1952 Mr. Easton came on the scene. The help that I have had from others, particularly Mr. Short and Mr. Easton, has contributed not only to the success, but also to the pleasure of the work. Mr. Easton has obtained a number of most interesting broods by his own pairings, as well as looked after my broods on several occasions. In the diagram of relationships the Greek and lower case letters represent my broods, the capital letters represent either source broods or broods raised by Easton's co-operative efforts in 1952 and 1953. Our work has been so interlocked that only on some arbitrary basis could we distinguish between "his" broods and "my" broods, and the basis chosen was responsibility for the actual pairing. I have always had to provide myself with such diagrams to keep the relationships and genetic constitutions in mind. Horizontal lines between broods indicate one or more successful pairings; these lines are of course absent when pairings are within one brood. Vertical lines (double when more than one female was used) lead down to the broods resulting. Small ♂ and ♀ signs indicate the sides from which the parents of those sexes were drawn.

Easton quickly paired an "albino" male of his own which was heterozygous for *sulphurea* with a *bryoniae* female, and the same year paired the resulting F.1 hybrids both among themselves and with my F.1. brood 1951- $\eta$  (which was heterozygous for both *sulphurea* and "albino"). The various forms appeared in the F.2 as expected, but two of the five broods were disappointingly small and none contained females homozygous for *sulphurea*. The fifth brood, 1952-S, was extremely successful, and produced albino hybrid females in numbers—a form never previously seen. I believe Easton is himself preparing for publication an account of this remarkable brood.

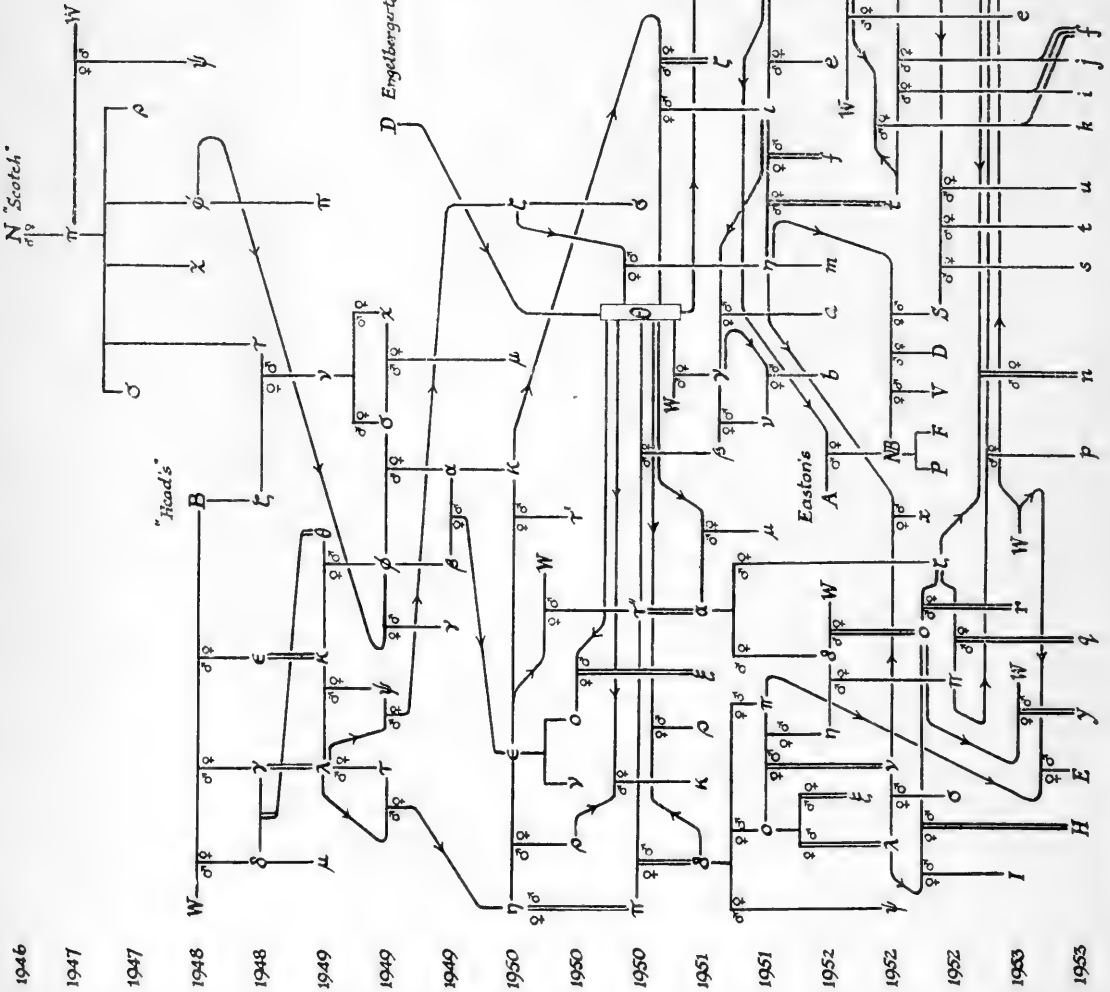
Previous to this I had made five attempts to obtain further F.2 broods, though from three of them, made in mid-April, I expected little. The first, from  $\gamma$  ♀  $\times$   $\iota$  ♂, gave me four eggs of which two hatched and produced butterflies. I obtained 28 eggs from an  $\iota$  female caged with two  $\xi$  males, but all were infertile. In the last April experiment two 1951- $\eta$  butterflies paired, but though well over 50 eggs were laid and some showed signs of development, none hatched. In late June I had two pairings between 1951- $\rho$  females and  $\eta$  males, but although a moderate number of eggs were laid none hatched. At the same time I paired three  $\eta$  females easily with their brothers but the numerous eggs produced only two larvae.

In August things went somewhat better. Two  $\eta$  females paired within a few minutes of meeting  $\iota$  males and produced a very large number of eggs, which yielded a total of four larvae. In the reciprocal cross one of the  $\eta$  males secured both the  $\iota$  females and these insects produced in all about 175 eggs, of which very few remained when hatching ceased. Fifteen larvae died, but since only 42 pupae were

BROOD RELATIONSHIPS.

- 1949—D = subsp. *bryoniae*.  
 1951—T = subsp. *flavescens*.  
 1952—C = subsp. *neobryoniae*.  
 1952—K = subsp. *adalwindae*.  
 1952—Y = subsp. *adalwindae*.  
 1948—B = *napi* f. *sulphurea*.  
 W = *napi* wild English stock.

In the original, the occurrence of recessive characters is indicated, for each brood, by coloured hollow squares, complete or incomplete. Within these, block colours distinguish sub-specific constitutions. Colour is also used on the sex signs to define individual insects.



Hybrids within the European *Pieris napi* species group

Diagram of Relationships

obtained a considerable discrepancy remains. Only this brood, 1952-*t*, has produced homozygous *sulphurea* females; there were six of these and three *sulphurea* males, which is reasonably close to expectation.

When all allowances are made, it is fair to say that fertility in the F.2 experiments was extremely erratic. In 1953 we again attempted the F.3, using the 1952 broods *t* and *S*. We tried  $t \times t$ ,  $S \times S$  and  $S \times t$  both ways; cold storage of our pupae enabled us to try repeatedly. In my own six attempts I used 2 *S* males, 3 *S* females, 8 *t* males and 7 *t* females, including one of the precious *sulphurea*. Two pairings were actually observed and in most cases large numbers of eggs were laid, but none hatched. Easton's persistent attempts were no more successful than mine. Though it cannot be said that it is quite impossible to raise F.3 hybrids, clearly they are much more difficult than F.2. Thus Müller and Kautz were right: *P. napi* and *P. bryoniae* behave as "good" species when crossed.

This need not mean that gene-exchange is impossible even now (still less that it was impossible in the remote past). The hybrids may be fertile with the parent species. Even if we had succeeded in getting our F.3, I should still have wished to back-cross the F.2 to *bryoniae*, with the ultimate aim of obtaining *sulphurea* in almost wholly *bryoniae* butterflies. In considering the back-crosses we may deal with the 1953 broods first.

On 3rd July a *sulphurea* F.2 male was caged with a female *bryoniae* of brood 1952-*k*. Next day they paired. A related female from 1952-*r* was then introduced, and four days later her sister. The third female paired after two days and after a further day the second female did likewise. The eggs already laid were now removed and the females separated. Fertility was high, though the number of eggs varied; the *k* female laid few after separation, but may have been responsible for most of those laid beforehand. Mortality was low and we reared 178 pupae from the three females. I tried to use the *sulphurea* hybrid male further with one of Easton's F.2 females, but this insect had meanwhile tried to drown himself and never fully recovered.

Males of Easton's large F.2 brood 1952-*S* were also used successfully with *bryoniae* females of brood *r*. Firstly, two males paired within a few hours with two females. The same males were then given another female, which was paired within a few hours. A white albino *S* male paired even more quickly with a further typical *bryoniae*. Very few eggs were laid in this last case, but fertility was high throughout.

I made two attempts at back-crossing F.2 females to *bryoniae* in 1953. In the first case the female escaped; in the second case, although no pairing was seen, the two females laid a rather large number of eggs, none of which hatched. Easton made many attempts to pair F.2 females, but whatever males were used he never obtained fertile eggs. It would appear, therefore, that the failure to get F.3 broods may be attributable to some inadequacy on the female side, though females do pair and often lay many eggs.

The back-crosses of F.1 males to the two parent species were made in 1952 with results adequate for our purpose. No pairings were seen, but one male of 1951- $\eta$  with two *napi* females homozygous for albino and *sulphurea* produced eight larvae from rather more than a dozen eggs, and all the expected four colour-combinations appeared in the resulting butterflies, which were very much like pure *napi*. For the back-cross to *bryoniae* two males of 1951- $\iota$  were used with one 1951- $\lambda$  female, which produced 44 eggs, most of them fertile. There were also two unsuccessful attempts to cross F.1 females back to *napi*, in both of which pairings were seen but still none of the eggs hatched.

The only brood ever certainly produced by an F.2 female was 1952-*b* obtained from a white 1951- $\nu$  female and a 1951- $\gamma$  F.1 male. There were about 76 eggs, but many did not hatch; two pupae died and 16 females only emerged. These insects were definitely peculiar, the wings soft as those of *Limenitis camilla* and the black scaling perhaps rather loose. The insects lacked nothing in energy and would soon have beaten their wings to pieces; almost all emerged well, even when retarded by cold to the following August. I made no attempt to pair any of them, as I felt that it would be useless and I had much else to do. This brood has to be contrasted with our other hybrids, among which males tended to outnumber females, sometimes significantly.

The crossing F.2  $\sigma \times$  F.1  $\phi$  was attempted only in April 1952 and produced no eggs.

The appearance of the hybrids must be described in as general a way as possible. To begin with, the F.1 hybrids did not differ essentially from Main's Simphon series, except that a larger proportion lay over the winter and assumed the appropriate "spring" form. No constant visible difference appeared between *napi*  $\phi \times$  *bryoniae*  $\sigma$  and *bryoniae*  $\phi \times$  *napi*  $\sigma$ . Our broods were numerous enough to show that Main's conclusion was fallacious, whatever the source of his error may have been.

The *bryoniae* cross with a wild-type male produced females (1951- $\gamma$ ) with markings intermediate in extent between *napi* and *bryoniae* and blacker (less brown) than in *bryoniae*. The bryo-streak was variable, but always present. The background-colour varied from full *flava* to almost white (but then a pinkish-buff tinge always remained in the forewings). There was no additional clouding on the outer margins of the forewings, as there often was among hybrids descended from Head's stock.

A male *napi* heterozygous for *sulphurea* produced 1951- $\beta$ . In both summer and spring emergences, the spot markings were somewhat heavier than in  $\gamma$ . Females varied from full *flava* to near white, but then always with a suspicion of pink-buff on the forewings. The bryo-streak was always present.

The three broods 1951- $\kappa$ ,  $\iota$  and  $\mu$  all had *sulphurea* male parents. The summer emergences of  $\kappa$  all showed additional "clouding" on the outer areas of the forewings. Spring emergences had markings blacker

than those of *bryoniae* and generally there was less "suffusion". There were no summer emergences from  $\iota$ ; otherwise it was very similar to  $\kappa$ . The brood  $\mu$  showed a great range of variation in background-colour, "suffusion" and depth and extent of markings, especially in the immediate emergences. All the females in these broods had the bryo-streak. Two sexual mosaics appeared in  $\mu$ , one in summer and one in spring.

The male parent of 1951- $\eta$  was a *sulphurea* albino. Only one insect (a female) emerged the same year, but in the spring appeared the full range of colours as before, but never a pure white female. All carried the bryo-streak.

From *napi* f. *sulphurea* ♀ × *bryoniae* ♂ there were three broods, 1951- $\zeta$ ,  $\xi$  and  $\rho$ . One male emerged the same summer from  $\xi$ , otherwise all lay over the winter. Nevertheless  $\rho$  produced one male which was definitely a "summer" form, with a large discal spot. The females of this brood fell within the usual range, but at least one of this sex too was apparently of "summer" form. There have been some oversimplifications (e.g. Thompson, 1947) in this matter of spring and summer forms, but I must not attempt to go into this now, nor into the effect on markings of holding pupae over two winters. The spot markings of  $\xi$  females were often exceptionally large and clear, and in some the radiated markings also were very sharply defined; background colours covered the usual range and all the insects had bryo-streaks. The brood 1951- $\zeta$  resembled  $\xi$  closely.

The difference between 1951- $\gamma$  and the hybrids heterozygous for *sulphurea* probably depended not on *sulphurea* itself but on the *confluens* complex associated with it by Head and still retained to some degree in our stock. The effect was, by increasing the extent of markings, to make the hybrids carrying *sulphurea* rather less like *napi* than 1951- $\gamma$  was.

Especially when they were fresh some of the female hybrids with a *sulphurea* parent showed an elusive pale golden lustre on the forewings, which seems to be due to a mingling of dark and yellowish scales. This is presumably what Hesselbarth (1952, 1953) called "a striking citron-yellow undertone"; he regarded it as a visible appearance of heterozygous *sulphurea*, but nevertheless held it to be confined to the offspring of *sulphurea* ♂ × *bryoniae* ♀. I at that time thought that it might be associated with the minor form *citronella* (Thompson, 1951) known in *P. napi* and was not sure of a connection between *citronella* and *sulphurea*. Later, lustrous and *citronella*-like forms turned up in crosses *neobryoniae* ♀ × *adalwinda* ♂ and in the F.2 from *flavescens* ♀ × *bryoniae* ♂ as well as in a cross *adalwinda* ♀ × *sulphurea* ♂. Since nothing that could be called a "citron-yellow undertone" is found in the majority of the offspring of *bryoniae* ♀ × *sulphurea* F.2 hybrid ♂, Hesselbarth's association of this appearance with single-dose *sulphurea* is probably incorrect; I now have an open mind as to its origin. Hesselbarth's 1952 paper, which reports briefly on three broods of hybrids, is accompanied by black-and-white illustrations which make it

clear that his F.1 females did not differ significantly in markings from ours; this is not surprising, as our stocks were in large part identical.

Hesselbarth never managed to obtain an F.2 hybrid brood; the nearest that he came to this was a back-cross of F.1 to *napi* heterozygous for *sulphurea*. Two *sulphurea* insects appeared from the 13 pupae, but these were both male.

Our own first F.2 brood, 1951-v, was incapable of producing homozygous *sulphurea*. Background colours varied from pure white to full *flava*. The extent of marking and "suffusion" varied quite independently of the ground-colour. Seven females were without the bryo-streak, but some of these were *flava*. On the other hand, another female would have passed as Engelbergertal *bryoniae*. This brood produced, besides, some very poor-looking insects, and some very under-sized.

Leaving aside Easton's notable brood 1952-S, the only other F.2 brood worthy of attention is 1952-t (broods 1952-m, a and f produced only eight pupae between them and though the females included interesting forms they need not be separately discussed). In 1952-t, as has been mentioned, appeared several males and females homozygous for *sulphurea*, as well as *flava* and white females marked like *bryoniae* and an otherwise very *napi*-like white butterfly which still carried the bryo-streak. The females of the "summer" emergence (which took place in December) were all particularly handsome insects. As I rather expected, the *sulphurea* females showed no admixture of *flava* colour.

It is clear that in the F.2 hybrids the various elements present in the parent species have sorted themselves out independently. Whereas the F.1 always carry the bryo-streak, some of the F.2 do not. Z. Lorkovič, in discussion of Hesselbarth's 1952 paper at the Amsterdam Congress, remarked that his own experiments had shown that *bryoniae* was dominant over *napi*, but only as regards the marking; the coloration was inherited intermediately. I have not been able to see any account of Lorkovič's experiments, but it does not appear to be true that the *bryoniae* markings are dominant in a strict sense. Sometimes they appear almost complete in an F.1 hybrid; but this is true also of the *flava* colour, which may even appear to be intensified owing to changes in the dark scaling.

Our back-cross of F.1 to *bryoniae* produced, as would be expected, insects resembling *bryoniae* very closely indeed; the markings, however, were definitely blacker.

The F.2 back-crosses to *bryoniae* have so far emerged as apparently normal insects, for the most part but not always following *bryoniae* in general appearance. The picture here is by no means complete, and I should like to defer comment.

## HYBRIDS OF OTHER SUBSPECIES.

Some of the hybridizing experiments reported in the literature were made with the two double-brooded *bryoniae* subspecies, *flavescens* Wagner and *neobryoniae* Sheljuzhko. Those of Kautz and of de Lattin, which are described by Müller and Kautz (1938: 159, 160) could hardly



be considered successful. According to Ryszka (1951), Fr. Stipan succeeded during the spring of 1951 in crossing British *napi* females (including one *sulphurea*) with *flavescens* males. I have not seen any report of the resulting insects. Ryszka himself obtained in the late summer a pairing of a British *sulphurea* male with a *flavescens* female. "This wonderful Pierid hybrid", he says, "occurs in white and a yellow form"—and he names it *newmani* after our member the butterfly-farmer. I regret that, as Ryszka informs me, his total emergences amounted to these two females, or he would probably have obtained a range of shades from full *flava* to white. It is not to be supposed that the *sulphurea* gene had any visible effect at all in these hybrids, though the associated banding genes probably contributed to their attractiveness.

With *flavescens* Wagner I have not myself been over-fortunate. Herr Hesselbarth kindly sent me 24 Mödling pupae at the end of 1951, from which emerged nine females and one male. The male failed to fertilize any females, so the pure *flavescens* line could not be continued. In December 1952 I had 24 pupae from Hofrat Ing. Kautz through Herr Theo. Busch, but although Kautz had certified them as latent-development pupae six had emerged on the journey and were crippled. A female emerged mid-January and three more pupae coloured the same month but dried up without emerging; all the others died. Early in 1953 Hesselbarth sent a further consignment drawn from two of his broods, but some were crushed in transit and the remainder died in cold storage.

However, a female *flavescens* from Hesselbarth's first consignment was paired with a male *bryoniae* and produced eggs noted as "about 30-40"; from these 34 pupae resulted. Two males and a female emerged the same year (1952), but the F.2 was not attempted till 1953. Then two females caged with three of their brothers both paired and produced very numerous eggs. Fertility was good, but some of the larvae grew so slowly that at first the laggards were taken to be waifs. A few larvae died very small and at least 22 others perished half grown. The larvae were divided and travelled between Letchworth and Reading, but the changes of food and conditions had no beneficial effect. Although all the eggs were laid by 27th July, moribund half-grown larva were still being discarded as late as 3rd October. The very slow larvae, when they survived, formed very small pupae. The final total was 175 pupae.

It is not necessary to say very much about the appearance of these insects. The F.1 female which emerged in 1952 might well be *flavescens* of the summer emergence. The spring females, though they varied a little in depth of *flava* colour, were really remarkably uniform; in all of them the *bryoniae* "suffusion" was very much reduced, so that they greatly resembled some of the *bryoniae-napi* hybrids of 1951-γ. The F.2 produced males and females in 1953, the latter mostly full *flava* but one almost white. Size variations were extreme. This brood, 1953-h, is only one brood (from two females) and maybe its apparent constitutional disorder means nothing. It may be, on the other hand, that its



growth hormones are disturbed. We hope to try to raise F.3 broods from its most normal-looking members. According to the Austrian authorities, *flavescens* and *bryoniae* are one species and the "hybrids" should be fully fertile and presumably not unhealthy. But it may well be that the gene-complexes, having been adjusted separately, give in combination less satisfactory results.

Similar initial trouble was encountered with the other double-brooded subspecies, *neobryoniae*. Herr Ryszka kindly sent me 36 pupae bred from Loibl Pass in Carinthia, but I obtained from them only a male and a female at the beginning of April 1953 and (from cold stored pupae) two females at the end of May. These last I paired with males of the arctic subspecies *adalwinda* Fruhstorfer (= *arctica* Verity), which has been variously regarded as a subspecies of *napi*, as a subspecies of *bryoniae* and as a separate species.

Two stocks of *adalwinda* were available: 24 pupae of 1952-K, from Kiruna parents paired in Germany by Hesselbarth, and six Abisko pupae (1952-Y) kindly sent by Dr. Björn Petersen. Among these, losses were few, and all the work with *adalwinda* proceeded according to plan, with Easton taking his share. We raised three broods of "pure" *adalwinda*, one by  $K \times K$  and two by  $K \times Y$ . The Kiruna insects were crossed not only with the *neobryoniae* females but also with female and male *bryoniae* of broods 1952-*k* and *r*. All these pairings produced larvae, but when all allowances are made fertility certainly varied widely. Also two *K* females caged with two *k* males produced about 70 eggs, none of which hatched although one pairing was actually seen.

Paired with subspecies *bryoniae*, *adalwinda* produced mainly overwintering pupae. Paired with the double-brooded *neobryoniae* it still produced more than half over-winterers. These broods were numerous and included some very large butterflies, which is perhaps rather unexpected in the offspring of such a small subspecies as *adalwinda*. Males measured up to 59 mm. and females up to 55 mm. ( $2 \times$  distance from centre of thorax to wing-tip). Ground-colour was generally a rather dull buff-ochre, though sometimes almost pure white. Several females showed *citronella* characters and others a violet sheen, inherited from the *adalwinda* side. The hindwings of some females were bright orange on the underside—another *adalwinda* character. Sometimes the extent of the dark "suffusion" was rather limited, but in general it was well developed.

The *neobryoniae*  $\times$  *adalwinda* hybrids emerging the same summer were mated to produce the F.2 on three occasions: of about 50-100 eggs, only three hatched; out of several dozen, only one; and even the brood 1953-*o*, which produced 68 pupae, contained many infertile eggs. Although there was little actual disease in 1953-*o*, at least 18 larvae failed to anchor themselves at pupation. Seven butterflies of this brood emerged in September and October 1953, all except one being males. The F.2 hybrids vary from large to small, and one buff-ochre female lacks the bryo-streak. The *neobryoniae*  $\times$  *adalwinda* hybrids are very

fine insects, but fertility appears to be much reduced and it seems doubtful whether an F.3 generation will be obtained.

The field of *adalwinda* × *napi* was originally left to Herr Hesselbarth. We did not at this time know of the breeding experiments of Petersen (1947) with Swedish stocks, in which crossings seem to have been carried as far as the F.2; we have only recently obtained the paper in which his results appeared. Hesselbarth was using *sulphurea* stock, but after an excellent beginning disease brought his broods to disaster. Easton therefore paired a Kiruna female with a Reading male and I paired others with *sulphurea* males. We have upwards of 120 F.1 pupae, which should enable the work to be resumed in 1954 without further delay.

### RELATIONSHIPS OF SUBSPECIES.

The northern Scandinavian subspecies *bicolorata* Petersen, which seems to lie between *adalwinda* and *napi*, appears to be of critical importance in determining the true status of *adalwinda*. Petersen (1949, 1951) regards these as three subspecies forming a cline, though the cline for yellow ground-colour does not altogether coincide with that for dusky markings. In a later publication (1952), Petersen makes the interesting suggestion that although by biological criteria *adalwinda* and *napi* belong to one species, in origin as well as in appearance *adalwinda* is nearer to *bryoniae*, which is (as he now agrees) a species distinct from *napi*.

It will not be very surprising if *adalwinda* crossed with British *napi* behaves differently from *adalwinda* × Swedish *napi*. Again, it may not be an accident that all the most successful attempts to breed *napi-bryoniae* hybrids have been made with British *napi*. I used to think that Verity was imaginative when he allotted southern English *napi* to a subspecies distinct from that of Central Europe, but visible characters are not alone to be considered. Hesselbarth (1953) reports "According to my observations *hibernica* [= *sulphurea*] pairs even particularly easily with *bryoniae*, while *bryoniae* and *napi* will unite only unwillingly. Herr Leidenbach of Lucerne tells me that he noticed the same thing". There is here some confusion, since any such differences noted by these workers can have nothing to do with *sulphurea* as such but are differences between British *napi* and Central European *napi*. We have noticed no difference of this kind between English wild-stock *napi* and our *sulphurea*.

Petersen and Tenow (1954), in a paper of the greatest interest, report on hybridizing and other experiments carried out with material from the Ostrach valley (Allgäuer Alps). They obtained in 1952 four crossings *napi* ♂ × *bryoniae* ♀, but found that those hybrid females that underwent diapause died slightly before or after eclosion, though the other insects were all normal. An F.2 generation was thus impossible in 1953; neither had they attempted to obtain an F.2 from the non-diapause hybrids, on the grounds that the summer generation insects do not pair in cages as readily as those of the spring, food for the larvae is

poor in late summer and the probability of disease is greater. The first reason certainly does not hold in Britain and it is possible here to surmount the other two difficulties, which may be connected. Part of this 1954 paper is concerned with the time of development of the pupae, and will be more conveniently discussed elsewhere.

Easton and I certainly were working in more favourable circumstances, but it seems clear that Petersen and Tenow met with greater genetic barriers between the species than are found in this country. Taking into account the observations of Fischer, Hesselbarth and Leidenbach, already mentioned, it seems probable that there is here a real difference: the barrier between *bryoniae* and the adjacent subspecies of *napi* is rather greater than that separating the more distant British subspecies. This is perhaps to be expected on general grounds. As Huxley (1942: 294-5) maintains "With the same degree of general character-divergence . . . types which have diverged in geographical isolation will show less effective barriers, direct or indirect, to fertility, than those that show ecological divergence in the same area". On the other hand, the differing histories of all these subspecies may provide a sufficient explanation. What barriers exist between *bryoniae* and *adalwinda* we have yet to see, but in a few months' time some indications may perhaps appear.

Then, what of the relations between *adalwinda* and the other arctic and sub-arctic subspecies of *napi*? The group is Holarctic in distribution, and the subspecies that it has developed in North America provide as promising a field of study as those of Europe and Asia.

It will be clear that our experiments have by no means been centred upon British *napi*: we have been using it to study other subspecies. It is not necessary to apologise for this, but perhaps it should be said in so many words that British *napi* is not "played out". For those able to travel around a little, who like to work on something that can be placed in a cabinet, there are still problems such as that of the pale yellow form which Mr. Thompson mentioned in his 1947 lecture (Thompson, 1947: Bowden, 1954b)—and whether *sulphurea* heterozygotes really are more plentiful in Donegal than elsewhere is not known with certainty.

Nevertheless even within the British Isles the most significant advances may now be made by studies in which the unit is not the individual butterfly but the population, and the really typical insects (if they can be found) are more valuable for experiment than the rarest variants. Work of this kind will be much hampered if too insular an attitude is adopted at the outset. This applies, of course, to other species beside *Pieris napi*.

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TABLE I—*P. napi* × *bryoniae*, F.1 Hybrids.

Brood	Butterflies caged together		Pairings seen	Eggs	Fertility	Larval losses by disease, &c.	Pupae formed	Pupal losses		Butterflies emerged (add cripples, in brackets)		See Note No.
	♀	♂						Before colouring	After colouring	♀	♂	
1951-γ	<i>bryoniae</i> 1 '50-θ	<i>napi</i> 2 W '50-ω 1 W. waif	8/6	>70	High	1 small larva	76	8+4+2	—	8+21+2	2+23+5 (1)	
1951-ε	1 '52-k		10/6	>40	20-25 eggs failed, some laid before pairing	—	21	—	—	0+5+0 (5)	0+10+0 (1)	
1951-β	2 '50-θ	3 Hh '50-κ	31/5	>113	Very few failed to hatch	2 larvae; also 1 by accident	97	0+3+0	—	8+35+0 (1)	2+47+0 (1)	
1951-μ	1 '50-θ	1 Hh '51-α	19/7	many	Last 2 failed to hatch	1 larvae by accident (1 isolated blacked off as pupa)	44	2+3+0	—	6+3+0 (2)	1+17+0 (6)	1
1951-κ	1 '50-θ	2 HhAd '50-p	7/7	many		—	50	1+1+1	0+0+5	5+8+1	0+15+10 (1)	2
1951-ι	1 '50-θ	3 Hh '50-κ	3, 7/7	many		1 small larva	38	0+1+0	0+?+0	0+11+0	0+21+0	
1951-η	1 '50-θ	1 HhAd '50-ζ	4/7	?		1 larva slow but produced butterfly	59	—	—	0+27+0 (1)	0+30+0 (1)	
1951-ρ	<i>napi</i> 1 HhAd '51-δ	<i>bryoniae</i> 1 '50-θ	5/8	?		None	45	0+0+12	—	0+6+5 (1)	0+15+0 (1)	3
1951-ι	2 Hh '50-κ		4/7	probably few	16 larvae obtained	None	.16	0+3+6	—	0+4+0	0+3+0	4
1951-ξ	3 Hh '50-ο		19/7	?		1 pre-pupa	60	0+1+12	—	0+15+0 (1)	1+30+0 (1)	5

TABLE II—*P. napi* × *brioniae*, F.2 Hybrids.

Brood	Butterflies caged together		Caging date	Pairings seen	Eggs	Fertility	Larval losses by disease, &c.	Pupae formed	Pupal losses			Butterflies emerged (add cripples, in brackets)		See Note No.
	♀	♂							Before colouring	After colouring	♀	♂		
1951-v	F.1 Hybrids		25/7	—	very many		3 very small+1 medium - sized larvae+2 pre-pupae	107	6+9+7	0+1+0	—	0+25+10 (1) (2) (1)	4+28+6 (5)	6
1952-a	1 '51-γ	1 <i>Hh</i> '51-α	17/4	—	4	2 hatched	None	2	—	—	—	0+1+0	0+1+0	
1952-m	4 <i>HhAa</i> '51-γ	4 <i>HhAa</i> '51-η	28/6	3	very many	Many appeared fertile but only 2 larvae	None	2	—	—	—	2+0+0	—	7
1952-f	3 <i>HhAa</i> '51-γ	3 <i>Hh</i> '51-α	23/8	2	very many	Only 4 larvae	None	4	—	—	—	1+0+1	2+0+0	8
1952-t	2 <i>Hh</i> '51-α	2 <i>HhAa</i> '51-η	23/8	2	173	A few failed to hatch	15 larvae; also 3 by accident	42	3+1+0	—	—	4+10+1 (1) (1)	10+11+0	9

TABLE III.—*P. napi* × *bryoniae*, BACK-CROSSES.

Brood	Butterflies caged together		Caging date	Pairings seen	Eggs	Fertility	Larval losses by disease, &c.	Pupae formed	Pupal losses		Butterflies emerged (add cripples, in brackets)		See Note No.
	♀	♂							Before colouring	After colouring	♀	♂	
1952-x	<i>napi</i> 2 hhaa '52-v	F. 1 Hybr. 1 HhAa '51-γ	26/8	—	>12	8 larvae	None	8	—	1+0+0	0+ 0+1 (1)	1+ 4+0	10
1952-e	<i>bryoniae</i> 1 '51-λ	F. 1 Hybr. 2 Hh '51-λ	2/5	—	44		None	29	0+ 0+7	—	2+ 0+6	0+ 0+6 (8)	11
1952-b	F. 2 Hybr. 1 '51-v	F. 1 Hybr. 1 '51-γ	2/5	—	ca. 76	Many did not hatch	None	18	0+ 2+0	—	6+ 9+0 (1)	—	12
1953-f	<i>bryoniae</i> 3 '52-k, r	F. 2 Hybr. 1 hh '52-t	3-8/7	3	?	No notes, but believed high	1 pre-pupa	51	1+ 4+8	0+1+0	1+15+0 (2)	0+16+0 (1)	13
1953-k	1 '52-k	1 hh '52-t	3/7	1 (in '53-f)	few	Some infertile	None	5	—	—	0+ 3+0	0+ 1+0	
1953-j	1 '52-r	1 hh '52-t	8/7	1 (in '53-f)	mod. many		1 pre-pupa	32	4+ 2+0	0+1+0	4+10+0 (1)	1+ 6+0 (1)	14
1953-i	1 '52-r	1 hh '52-t	4/7	2 (1 in '53-f)	many		3 larvae	94	3+13+0	0+4+0	1+23+0 (4)	0+30+0 (12)	15
1953-s	2 '52-r	2 '52-S	1/9	2	No notes		2 larvae; also 1 by accident	51	1+ 1+0	—	15+10+0 (1) (2)	0+15+0 (4)	16
1953-u	1 '52-r	2 (same) '52-S	6/9	1	Very few eggs failed to hatch		1 larva	47	1+ 1+0	—	0+1+0	0+16+0 (4)	
1953-t	1 '52-r	1 aa '52-S	1/9	1	6 larvae, no unhatched eggs		1 larva	5	0+ 1+0	—	1+ 2+0	0+ 1+0	

TABLE IV--STERILE GROUPS.

Sterile Group	Butterflies caged together		Caging date	Pairings seen	Eggs	Remarks on infertility, &c.	See Note No.
	♀	♂					
"F.1"	<i>bryoniae</i>	<i>napi</i>					
1951-(iii)	2 '50-θ	6 Hh '50-o	20, 25/5	—	0	Most butterflies died early Eggs did not hatch ♀ died in 7 days	
(iv)	2 '50-θ	2 Hh '50-r	2/6	1	ca. 15		
(vi)	1 '50-θ	2 Hh '50-ε	14/5	—	0		
(xiii)	1 '50-θ	2 Hhaa '50-r	3/6	1	5	Infertile ♀ died after 5 days	
(xx)	2 '50-θ	1 Hhaa '50-r	19/7	1	mod. no.		
(xi)	1 '50-θ	2 W. '50-ω	15/6	1	1		
(ix)	1 '50-F	2 W. '50-ω	6/6	—	0		
1951-(i)	<i>napi</i>	<i>bryoniae</i>					
(vii), &c.	1 Hh '50-ε	6 '50-θ	10, 14/5	—	0	Weather unfavourable Some at least of ♀♀ weak	17
(xxii)	6 Hh '50-o	10 '50-θ	18-27/5	—	ca. 40		
(xxiv)	1 HhAa '50-p	2 '50-θ	1/7	—	20?	See note on larva found Infertile	18
(viii)	3 Hhaa '50-ε	same 2 as last	7/7	—	?		
(x)	4 Hhaa '50-ε	2 '50-F	26/5, 1/6	—	13		
	1 W. '50-X	2 '50-F	14/5	—	0		
"F.2"	F.1 Hybrid	F.1 Hybrid					
1951-(xxi)	1 '51-γ	1 '51-γ	22/7	1	?	Eggs failed to hatch Many obviously infertile Infertile	19
(xxii)	1 '51-β	1 '51-β	29/7	—	many		
1952-(viii)	1 Hh '51-α	3 Hh '51-ε	14, 17/4	—	28		
(ix)	1 HhAa '51-η	2 HhAa '51-η	17/4	1	>50	Some eggs showed signs of development Infertile	
(x)	2 Hh '51-ρ	2 HhAa '51-η	28/6	3	mod. no.		
"F.3"	F.2 Hybrid	F.2 Hybrid					
1952-(xi)	1 '51-v	2 '51-v	20/4	1	1	Infertile See note on larva found	20
(xii)	2 '51-v	4 '51-v	23/8	—	very many		
1953-(x)	1 Hh '52-t	2 Hh '52-t	1/9	—	0	♀ poor None hatched	21
(xi)	2 '52-t	same 2 as last	5/9	1	many		
(xii)	1 '52-S	1 Hh '52-t	14/7	—	>24	♂ had paired 3 times None hatched	
(xiii)	2 '52-t	3 '52-t	3-7/9	—	many		
(xiv)	2 '52-t	2 '52-S	7/7	1	very many	Infertile	
(xv)	2 '52-S	2 '52-t	7, 9/7	—	many		
"F.1 Back-cross"	F.1 Hybrid	<i>napi</i>					
1952-(xiii)	1 '51-γ	1 W. wild Herts.	30/4	1	20	Infertile Infertile	
(xv)	1 Hh '51-ρ	2 aa '52-η	26/7	1	many		
1952-(xiv)	1 Hh '51-α	F.1 Hybrid '51-ρ	2/5	—	0	♀ believed crippled	
"F.2 Back-cross"	F.2 Hybrid	<i>napi</i>					
1952-(xvi)	1 '51-v	1 W. wild Herts.	18/5	—	0	♂ had damaged wings	
1953-(xvi)	F.2 Hybrid	<i>bryoniae</i>					
(xvii)	1 '52-S	2 '52-r	1/9	—	0	♀ escaped None hatched	
	2 '52-S	same 2 as last	1, 7/9	—	many		
1952-(xvii)	F.1 Hybrid	F.2 Hybrid					
	1 Hh '51-ε	3 '51-v	12, 17/4	—	0		



## REMARKS ON THE TABLES (June 1955)

Tables I to III assemble the more important details of hybrids between British *P. napi* and Swiss *P. bryoniae* obtained from the lecturer's pairings in the three years 1951-3. Emergence figures for the broods concerned have been completed and include natural and retarded emergences in 1954 and 1955. Table IV relates to the corresponding unsuccessful cagings.

Similar tables for the pure species bred during the same three years were prepared but do not merit publication, even for comparison. It will be sufficient to give the following summary:

	No. of broods in 1951-3	Av. No. of pupae obtained	Sterile cagings
<i>P. bryoniae</i>	5	29	3
<i>P. napi</i>	19	41	17
F.1 hybrid	10	51	16
F.2 hybrid	5	31	5
F.3 hybrid	0	—	8
Back-crosses	10	34	7

It is considered that little quantitative significance attaches to these comparative figures. The best breeding months were largely devoted to the hybrids.

Pupae which died after "colouring up" and cripples (generally, insects judged too deformed to fly normally) should probably be counted together as no firm line can be drawn between them in practice. At first, some insects which failed to make good their emergence were neglected and this is one source of discrepancies in the tables.

Emergences without diapause ("summer brood") are entered first, followed by emergences of the following spring and summer (including emergences retarded by cold storage) up to about mid-October, followed again by those that were retarded (either from natural causes or artificially) to a still later time. Thus the 8 + 21 + 2 female butterflies entered for 1951- $\gamma$  emerged 22/7 to 6/8/51 + 5/4 to 29/9/52 + 1/12/52.

Deaths in pupa, etc., are similarly recorded. Pupal losses "before colouring" do include a few pupae of undetermined sex dying after colouring.

The following abbreviations are used to describe butterflies in the table:

*hh* : *sulphurea* Schöyen (*hibernica* Schmidt) homozygote.

*Hh* : *sulphurea* heterozygote. *aa* : "albino" homozygote.

*Aa* : "albino" heterozygote. *W.* : wild type (southern England).

## TABLE NOTES.

1. Also 1+1+0 sexual mosaics.
2. Also 0+0+1 sexual mosaics (but one *P. napi* brood, 1951- $\alpha$ , produced at least 24 sexual mosaics!).
3. Six pupae, not cold-stored, lay over second winter. All were ♀; only one emerged 1953.

4. Six ♀ pupae, not cold-stored, failed to develop in 1952. All deteriorated during second winter.
5. Twelve ♀ pupae, not cold-stored, behaved in the same way. Emergences from cold-stored pupae of this brood continued till 27/10/52.
6. Five ♀ pupae, not cold-stored, deteriorated during second winter.
7. One of emerging butterflies may have been a *napi* waif. Other was of extreme hybrid form.
8. "Summer-brood" butterflies emerged Dec. 31 to Jan. 12. A ♀ (not cold-stored) which had not emerged by Sept. 1953, was then cold-stored till May 1954 and emerged normally.
9. Two cold-stored ♀ pupae failed to develop in 1953.
10. Two "summer" butterflies emerged, and one pupa failed, in Jan. 1953. One ♀ pupa, not cold-stored, lay over second winter.
11. Single females emerged July 3 and Nov. 7, the latter rather of "summer" form. Remaining pupae cold-stored Jan. 27 to Nov. 30.
12. Six females emerged June 25 to July 3, 1952. One ♀ emerged late Dec. 1952 and entirely resembled "spring" insects.
13. Brood 1953-*f* was mixed early  $i+j+k$  (same ♂ parent). Six ♀ pupae which lay over second winter all died.
14. Female of 12/12/53 counted as "summer" emergence.
15. Females emerged Nov. 29, 1953, to Feb. 3, 1954, and Mar. 1 to May 10, 1954; most resembled "summer" form. Males emerged April 25 onwards; all were of "spring" form. Three males (in addition to cripples) had transparent patches on forewings.
16. A female (not cold-stored) emerged as late as Nov. 30, 1954. Two other ♀ pupae, put in cold storage for second winter, emerged in June, 1955.
17. Groups (vii), (xiv), (xv), (xvi) taken together here.
18. One larva, medium-sized when first seen, produced a definitely hybrid ♀, but parentage rather uncertain.
19. Eggs apparently started development.
20. One larva. This produced white ♂ which failed to make its emergence in December—possibly a waif. One of the females lived 54 days.
21. See 1953-*f* for previous pairings of ♂.

## BLACK AND WHITE ENTOMOLOGICAL DRAWINGS FOR REPRODUCTION.

By F. D. BUCK, A.M.I.Ptg.M.

Read 12th May 1954.

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A very well-worn cliché runs "a picture is worth a thousand words" which happens to be all very true, and nowhere is it more apt than when used in connection with entomological notes and papers. Few papers could not be improved with one or more line drawings, graphs or maps, and in consequence it is rather surprising that these illustrations are so often neglected entirely, especially when with a little practice simple line drawings suitable for reproduction can be easily produced.

Often one finds confusion as to what can be reproduced as a line illustration, and frequently editors and printers are presented with a sketch or drawing which is only suitable for half-tone reproduction, or will not reproduce at all. An examination of these two processes will perhaps clear the air.

**LINE REPRODUCTION.** This process only reproduces plain blacks and whites and any variation in tone between these two can only be produced by means of adapting black and white to obtain an effect of lighter or darker tones. Only in exceptional circumstances can charcoal drawing be reproduced by line process, thus these should be avoided because of the many complications which are attendant upon efforts to reproduce them by this method.

Briefly, the printing plate is made as follows:—The copy (i.e. the drawing) is photographed on to a sensitised glass plate which when developed becomes an ordinary photographic negative, this is reversed left to right and printed in the photographic sense onto a zinc plate sensitised with albumen and water and bichromate of ammonia. This causes the albumen-bichromate solution to become hard and insoluble in water where the light has reached it through the negative, the rest remaining soft and soluble. The plate is now washed under a faucet, the soft areas of albumen-bichromate washed away leaving the zinc exposed. It is at this stage where things go wrong with drawings which contain greys and colours. The greys obviously, and the colours because there is no way of registering colour as such on an ordinary photographic plate, will register as a shade of grey in the negative. Now this will give varying degrees of hardness to the albumen-bichromate solution and since when washing the zinc plate the solution must either wash away or remain, these areas theoretically at least must be either black or white—in practice they usually emerge as areas of patchy, irregular black smudges. After washing, the zinc plate has the back and sides protected with an acid resistant and is immersed in an acid

bath which eats away the areas unprotected by the albumen-bichromate, this leaves the protected areas raised. It is only the raised areas which print on the paper when the block is on the printing press.

**HALF-TONE REPRODUCTION.** For our purposes the most important difference in this method from that of line reproduction is in the insertion of a glass screen, ruled with two sets of oblique lines set at an angle of  $90^\circ$  to each other, between the copy and the photographic plate. This breaks up the copy into minute dots, each the same distance from the other centre to centre. Where there are solid blacks the dots are large and sometimes touching, where there are whites they are very fine and apparently diffuse. The size of the dots in the greys vary in direct proportion to the density of the grey. Thus though the whole picture is printed with black ink an illusion of different shades of grey is obtained by the varying size of the dots. An examination of a half-tone illustration under a lens, the one facing page 92 for example, will make this abundantly clear. The detail of production in this process is deliberately neglected because half-tone illustrations have no place in this paper, however the basic principles can be used in line illustration with good effect.

### METHODS.

There are two basic methods of drawing subjects staged under the microscope, the camera lucida and the squared eye-piece (graph graticule).

**THE CAMERA LUCIDA** is a method of tracing by means of reflection and projection. The drawing board is reflected by an inclined mirror through an aperture in the side of the eye-piece onto a prism which superimposes the drawing board and the subject in the field of vision. The subject is then traced on the drawing board.

There are a number of disadvantages of which the greatest is the expense of the camera lucida itself. Also the drawing board is tied to the microscope and if the board is moved the effect is the same as moving the tracing paper when tracing direct; therefore the initial stages of the drawing must be completed at one sitting. There is a certain amount of light lost in the use of this apparatus and the size of the drawing is controlled by the size of the objective. Two quite minor points, one, that the pencil is easily lost by moving it out of the field of vision, and two, there is a certain amount of difficulty in obtaining accurate compensation for the difference in angles when using a Greenough type microscope.

**THE SQUARED EYE-PIECE** is a method of drawing by means of comparison. A transparent disc, squared off on the metric system, dropped into a  $\times 10$  eye-piece is automatically superimposed on the field. Drawing is carried out freehand, on a board which has previously been squared off, by maintaining the drawing in the same relationship to the drawn squares as is the subject to the eye-piece squares. Comparison with the camera lucida appears to the author to have several distinct advantages; the cost of the disc is only a few shillings, the size of the drawing is not in any way restricted by the microscope but is controlled by the

size of the drawn squares, the board is not tied to the microscope, indeed the drawing board can be inverted if it is easier to draw a particular line that way, or the drawing where complicated, can if necessary be spread over several sittings provided the subject is not moved on the stage of the microscope, furthermore there is no loss of light.

This method does, however, require a little more skill with the pencil than does the camera lucida, but this is easily acquired with a little practice.

It is proposed from this point to deal with the subject from the aspect of the squared eye-piece for the very good reason that it is most likely to be used because of the prohibitive cost of the camera lucida, and in any case the majority of the remarks apply to both methods.

### MATERIALS.

There is a wide range of materials available and we can only base an opinion on what most suits our own particular needs and tastes. However amongst the materials on sale at the various art dealers there are some which are quite out of the question as far as drawing for line reproduction is concerned.

**BOARDS AND PAPERS.** A board with a good hard, smooth, non-absorbent surface is required, which will take ink and white easily and smoothly, on which it is possible to use a fine pointed pen without plucking or digging, and which will permit the reasonable use of an eraser without losing its surface. It should be absolutely white or preferably with a slight bluish shade.

There is no doubt that Bristol board fills these requirements best and is the best surface on which to execute drawings for our present purpose. Photo engravers, when producing their own art work, use it almost exclusively. It is made in various thicknesses, 2-sheet, 3-sheet, 4-sheet and 6-sheet, and though it is an expensive material the 2-sheet is much cheaper than the 6-sheet and quite adequate for our purpose. Bristol paper is manufactured but is in little demand and may not be easy to obtain.

A reasonably priced substitute is Hot Pressed Board which though not as white as Bristol and not having quite the same surface will be found satisfactory if a little extra care is exercised, particularly when working with fine pens and in using the eraser. In the opinion of the writer the difference in price is not sufficient to warrant the selection of this board unless a large number of drawings are contemplated and even then one should be quite familiar with work on Bristol Board first.

Cartridge papers should be avoided; in entomological work a good clear, crisp line is required. This is not possible on cartridge as under a lens the ragged lines are obvious.

**PENCILS, PENS AND BRUSHES.** The point to bear in mind concerning pencils is that the harder they are the finer the point that may be maintained, also that if a hard pencil with a fine point is used too

heavily it will score the surface of the board and will be impossible to erase. There was a time when the grading of pencils could be relied upon, but these days they vary from maker to maker, but as a rough guide an HB or H is recommended for normal work and a B for preparing tracings for transfer.

All the pen work, except that of a very coarse nature, can be executed with mapping pens, the majority with the ordinary "crow quill". Fine work, however, will probably require the use of a Mitchell or Perry lithographic pen. It is possible to obtain a card containing one each of the entire range and are invaluable for obtaining an idea of what can be done with these lithographic pens, one can then select two or three which should cover all one's needs.

Sable or Camel hair brushes are suggested for the brush work. It pays to obtain really good brushes as with care they will last years and when purchasing them ensure that they are capable of being brought to a fine point when wetted. The author uses a No. 1 or No. 2 for the larger areas of black and a No. 00 or No. 0 for smaller black areas or work with white.

**INKS.** The most effective black is Waterproof Indian Ink. The only drawback to Indian ink is its tendency to clog, but provided the top of the bottle is not left off unnecessarily and the pen is cleaned frequently the ink will run quite freely. When quite dry, errors can be painted out with white, it may take a couple of applications but they can be completely obliterated. There is an unfixed black, which is denser than Indian ink but which is not waterproof and will mingle with white even when quite dry.

For obliterating errors and cleaning up the edges of any ragged lines, Process or Permanent White should be used. Why Chinese White always jumps to mind whenever white is indicated is beyond comprehension. Cox and Cannon (1954, *Printing World*, 154 (17): 482) when writing on the preparation of copy for line reproduction have this to say (in bold type): "On no account must Chinese White be used, and although photoengravers have been saying this for years, some artists still use it, not realising that it photographs as grey and will need retouching on the negative". When it is used in colour work the labour involved in colour correction is often enormous.

### TECHNIQUE.

Stage the subject by pinning into a block of plasticine, focus accurately, then adjust the position of the subject so that it is staged symmetrically under the squares of the eye-piece, preferably with one of the lines running down the centre of the insect. This is easily accomplished with accuracy by kneading the plasticine block in which the insect is pinned. Now the lines of the squares can be drawn lightly in pencil on the board, these will be of a size that will give the desired final dimensions. For instance, if the specimen to be drawn is 3.5 mm. long, the eye-piece is squared in .25 mm., and the drawing is required

approximately 5" deep, then the board may be squared by lines  $\frac{3}{8}$ " apart which will produce a drawing  $5\frac{1}{4}$ " deep. By juggling metric and inch measurements or by using dividers a closer approximation to 5" could be obtained. When deciding the size of a drawing allow for it to be reduced to about one-third of its size, this sharpens up the drawing considerably and tends to even out any irregularities and inconsistencies in the lines.

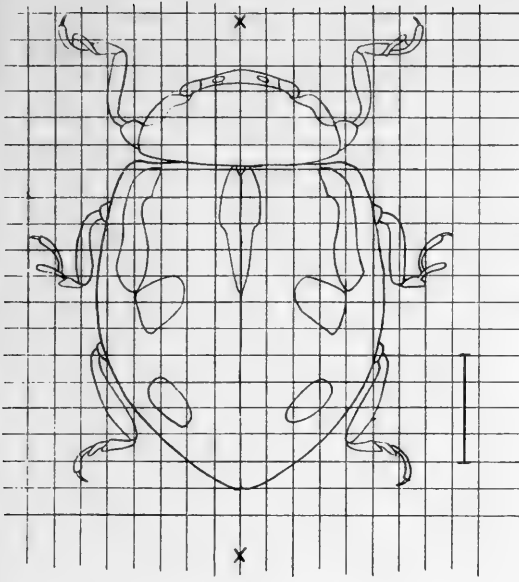
The squares on the board must be carefully drawn, any inaccuracies at this stage will be reflected in the final result. Mark the central line by putting a cross or similar mark top and bottom and draw the left hand side of the body lightly in pencil, square by square, commencing at the top and working to the bottom. Now add the appendages, legs, antennae, etc. These will be slightly out of focus and care is required otherwise they will be drawn too wide or too thin. On no account must the focus be altered as this will move the specimen in relation to the squares. Perhaps the greatest difficulty may be encountered with the antennae, if the specimen is carded segment 11 will be in a lower plane than segment 1, and if not carded the antennae will probably curl in several directions, therefore some of the segments will be foreshortened. There are several ways of dealing with this: (a) the antennae can be drawn as seen and a note made of the foreshortening, (b) adjustments can be made during drawing, (c) they can be left till last, the specimen rearranged and the antennae drawn, this requires careful placing. A directional line and segment 1 should be drawn before moving the insect, or (d) a separate drawing can be made. In practice (b) will probably be the most satisfactory, though (a) will be the easiest.

It is now possible to proceed along two lines:—

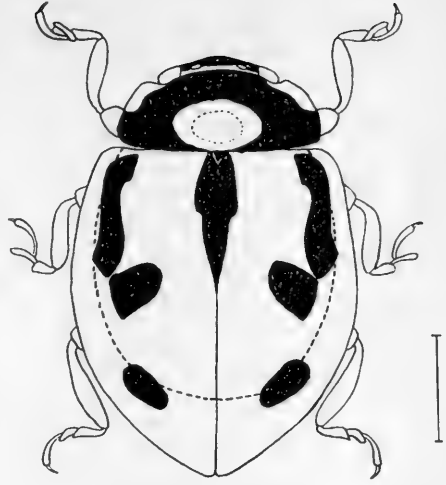
- (1) The right hand side can be drawn in the same manner as was the left.
- (2) The left hand side can be traced on to the right (this, of course, can only be employed on symmetrical work).

A tracing can be made on thin transparent paper with a soft pencil, ensuring that the centre line is marked in first. The tracing paper is then turned over, the centre lines registered one on top of the other and the outlines matched where they join the centre line. By scribbling on the tracing paper the original tracing will be transferred down on to the board. This means of completing the drawing is preferable because any error made in executing the left side is duplicated and if serious, becomes obvious and can then be rectified. (This tracing method is very useful when more than one similar drawing is required.) The details can now be inserted, markings, setae, etc., including a scale (metric), and the whole drawing inked in (fig. 1). During work on the drawing use a sheet of blotting paper on which to rest the hand, this will protect the work and prevent it becoming unnecessarily grubby, also it is as well to wait until the drawing is complete before erasing the pencil work and generally cleaning up the drawing, unless it becomes necessary to erase certain pencil work for the sake of clarity.

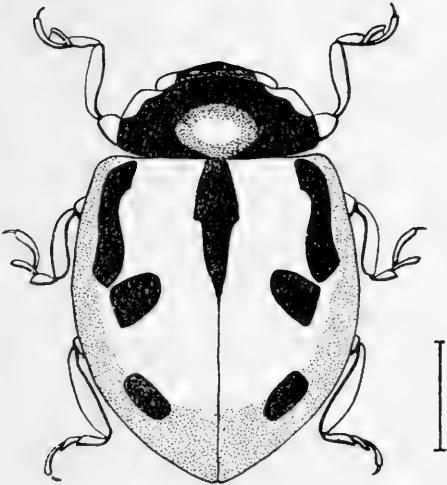




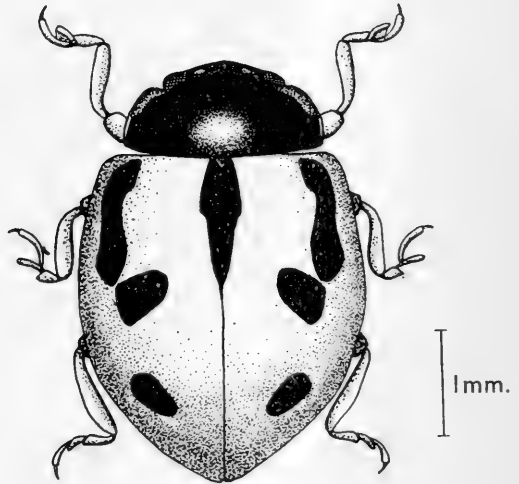
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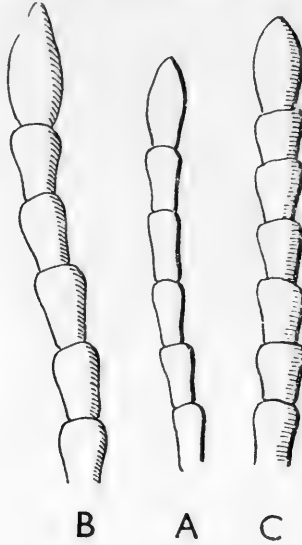
6

Figs. 1, 4, 5, 6. Stages in the development of stipple shading.

**SHADING.** Plain outline drawings have a flat and uninteresting appearance and, though infinitely preferable to no drawing at all, can be considerably improved by a little shading, also many details cannot otherwise adequately be shown.



There is little difficulty in narrow appendages and by thickening the lines on one side (fig. 2a) or by a series of small thin lines on one side (fig. 2b), or by both combined (fig. 2c) shadow can be indicated. However, in larger areas the stipple technique is perhaps the most effective and gives the greatest latitude in tone. The value of the tone depends on the amount of black in relationship to white and is an adaptation of the principle governing the half-tone illustration, but also allows for a varying space between dots in the same illustration



## 2

Fig. 2. Shading of narrow appendages.

besides varying their size to a far greater extent than is possible with that form of reproduction. Figure 3 shows the effect of varying the weight and the spacing of the dot; "A" shows dots of even weight but with the lower half spaced much closer together; "B" is the same as "A" but uses a dot of greater weight; "C" shows dots of even weight gaining a darkening effect by closing up towards the centre at the base; "D" increases the effect by enlarging the size of the dots as they become closer.

To make use of this, mark on the drawing in pencil a line halfway between the lightest and darkest tones (fig. 4), then put in the middle tone evenly up to this line (fig. 5), finally deepen into the shadows and even out into the highlights (fig. 6).

For shading the light should normally be adjusted to come from the top left hand side, but this can at times be varied with good effect—however if there is any doubt top left lighting is safest.

**DETAILS.** A number of details of sculpturation or clothing may present a certain amount of difficulty and these must be treated on their merits, but a few remarks on the commoner forms would not be amiss.

Puncturation in most cases should be put in after shading has been completed. The means of indicating the position of the punctures will depend upon the density of the puncturation. When this is close the position of the punctures can be indicated over a small area by comparison with the specimen and this density repeated over the whole.

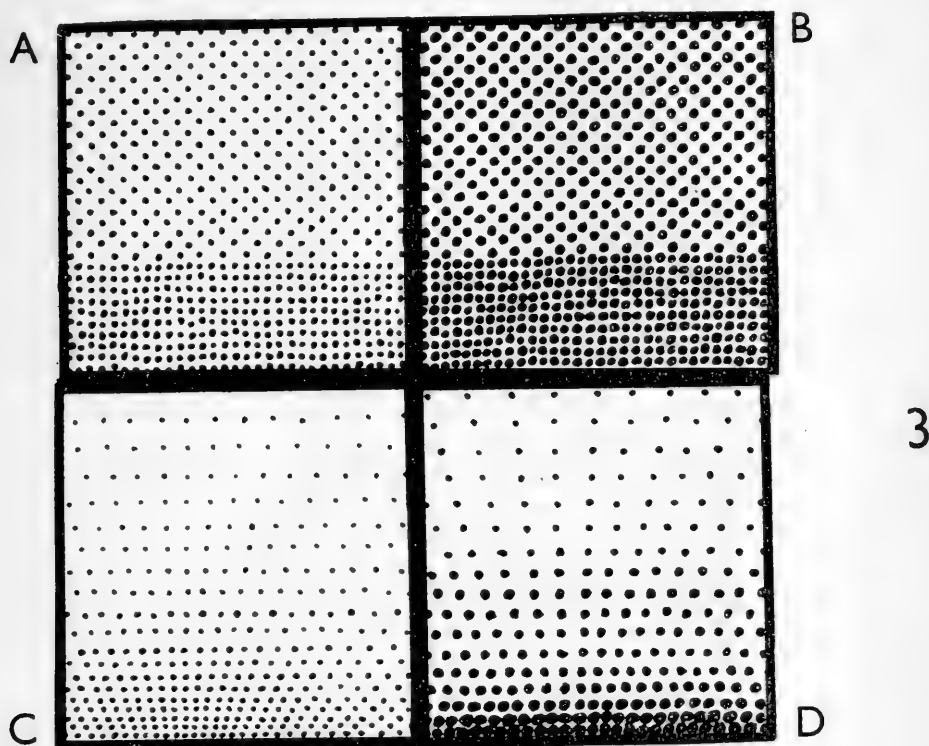


Fig. 3. The use of dots to vary the tone of shadow.

However, when the puncturation is sparse, or only the puncturation of a limited area is to be shown, each puncture will be positioned by comparison with the insect. It will be noted that the anterior side of the puncture is in shadow while the posterior part is shining, this effect is most easily obtained by drawing a crescent of two-thirds of the periphery of the puncture, taking out the shading on the posterior portion with white, and if necessary, shading the crescent into the puncture pit and back into the normal shading of the area in which it lies. Fig. 7 show the effect required (a), and the means of obtaining it (b). Coarser, heavier puncturation can be improved with a little linear work in the shadows (fig. 9).

Tuberculation is best put in by leaving each tubercule white when shading and then individually treating each tubercule when the basic shading is completed. The effect required (A) and the means (B) are illustrated in fig. 8. The remarks about positioning punctures apply equally well to this kind of sculpture.

Eyes, though comparatively simple when finely faceted, are by no means easy when the facets are coarse. In the former case the solid blacks are painted in and the facets put in the remaining area by cross hatching. The shadows are eased out into the high lights by using the stipple technique disregarding the cross hatching (fig. 10). The eyes with the coarser facets are best treated by cross hatching the facets in

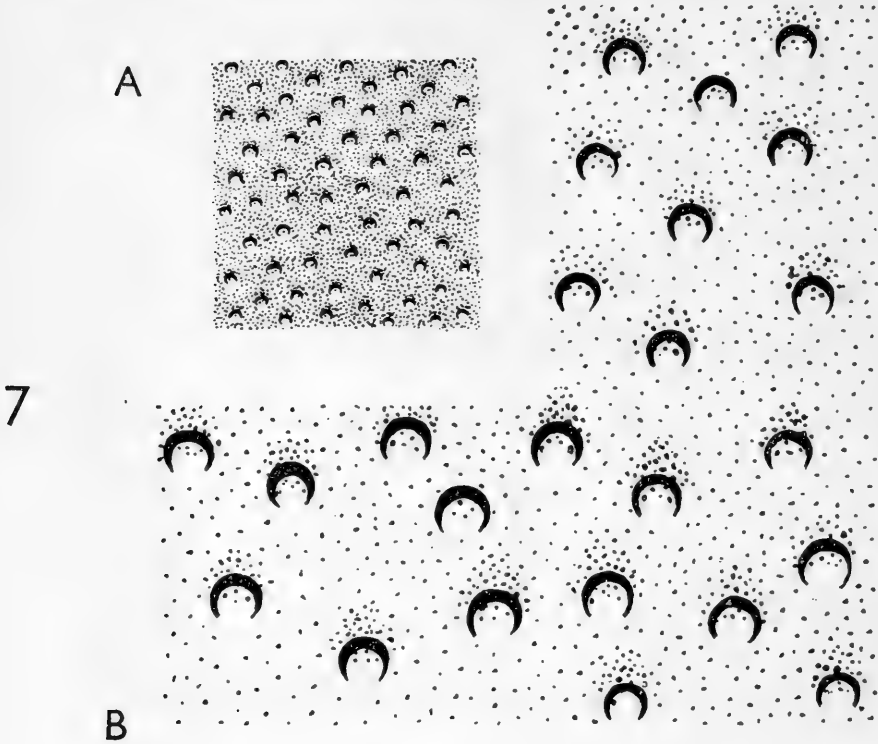


Fig. 7. Normal puncturation : A, the desired effect, and B, enlarged drawing to show technique.

first (fig. 11a), then round off the high light in each facet (fig. 11b) and finally reducing these high lights towards the shadows (fig. 11c).

Setae and pubescence should be put into the drawing with rapid strokes of the pen always working from base to apex, this gives the firm base and finer point one finds in this form of clothing. The positioning, of course, must be treated as was puncturation and tuberculation. When the pubescence is black the above treatment readily obtains the desired effect, but when white pubescence occurs on a dark insect this cannot easily be depicted by using process white on indian ink. The process white does not show up sufficiently with one application and when two applications are applied the delicacy of the pubescence is lost. However, when the drawing is done on scraper board, which will be dealt with later, white pubescence is easily shown on a dark insect (fig. 15).

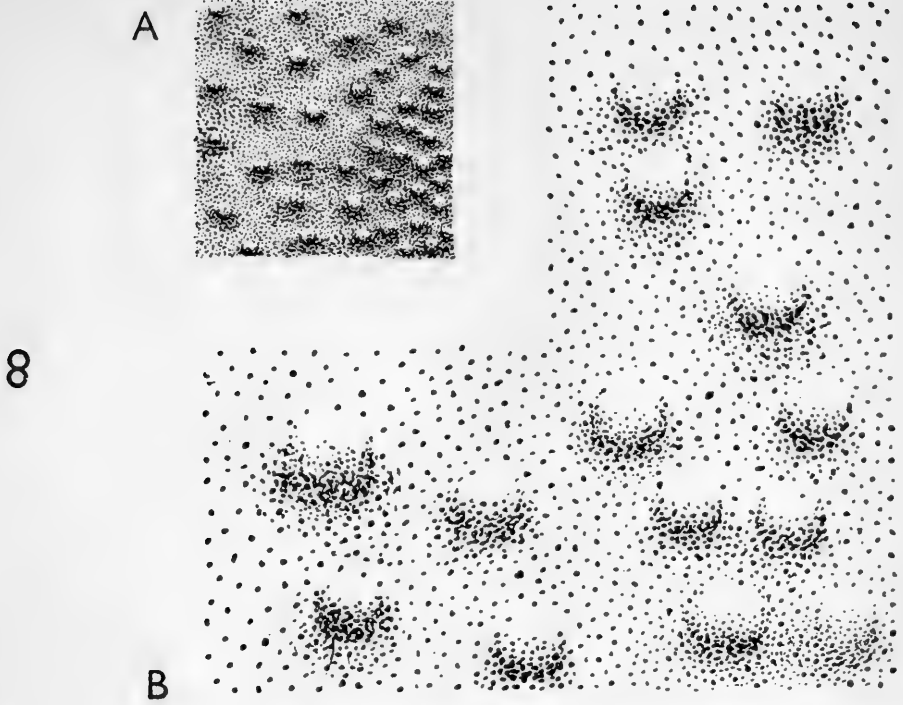


Fig. 8. Tuberculation : A, the desired effect; and B, enlarged drawing to show technique.

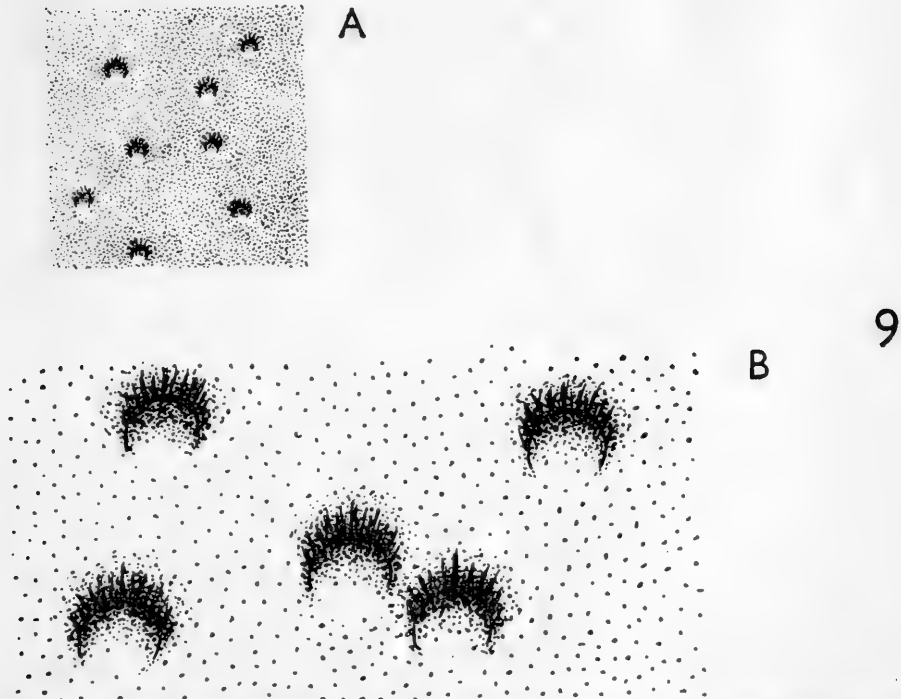
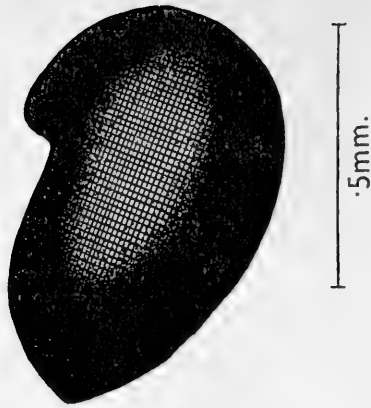
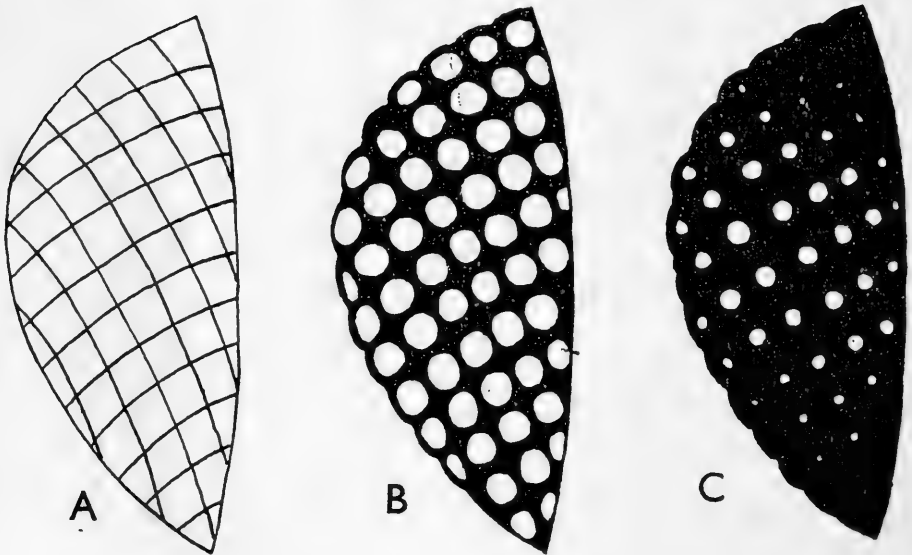


Fig. 9. Large puncturation : A, the desired effect; and B, enlarged drawing to show technique.



10

Fig. 10. A finely faceted eye.



11

Fig. 11. Stages in the production of an eye with coarse facets.

### SUBJECTS TOO LARGE FOR THE MICROSCOPE.

All subjects may not be small enough for examination under a microscope, for example most lepidoptera would be impossible this way. Therefore one has to find another means to deal with these larger insects. Staniland (1952, *Principles of Line Illustration*, London) gives a method of drawing plants by examination through an aperture and tracing on a glass plate inserted between the plant and the aperture. Using this method the dimensions of the drawing are confined within certain limits and at its largest can only be slightly smaller than the subject. Obviously this is inadequate for our purpose. However, it

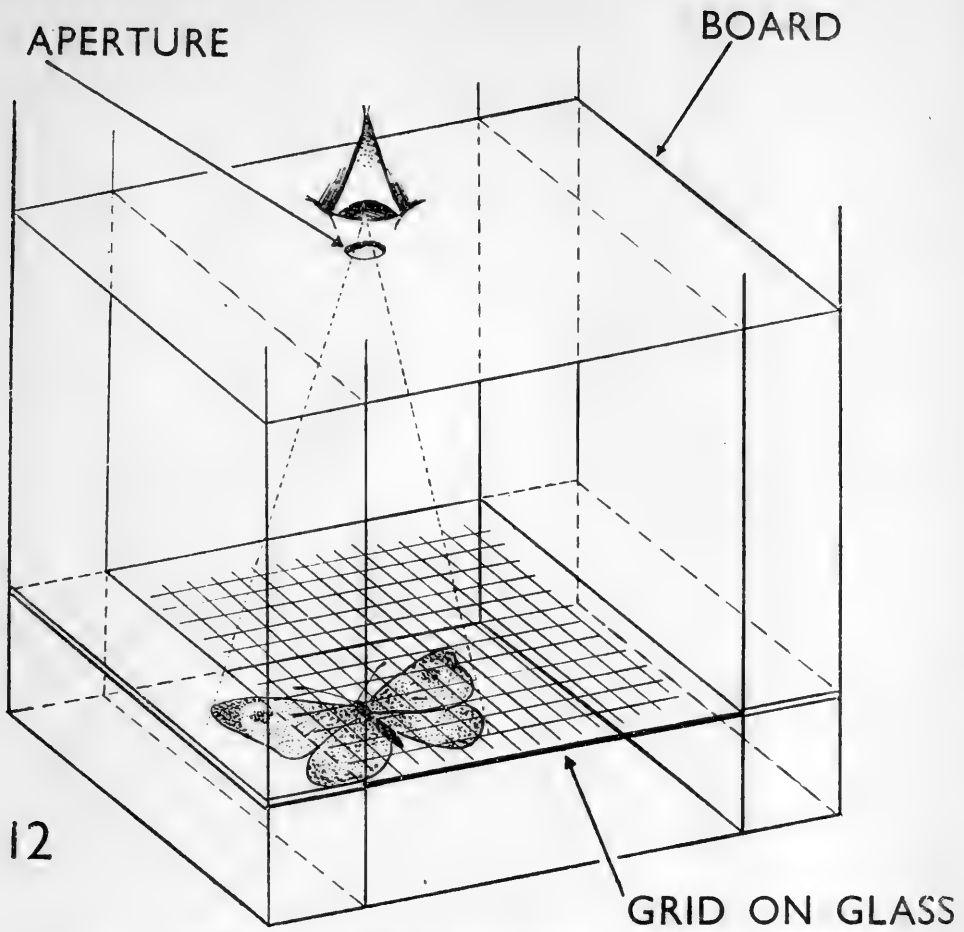


Fig. 12. Apparatus for drawing subjects too large for the microscope.

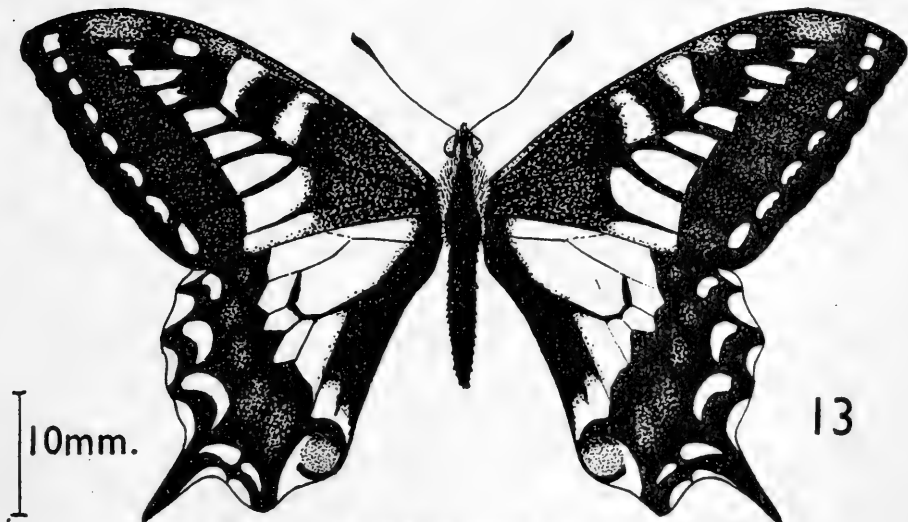


Fig. 13. A drawing made by this method.

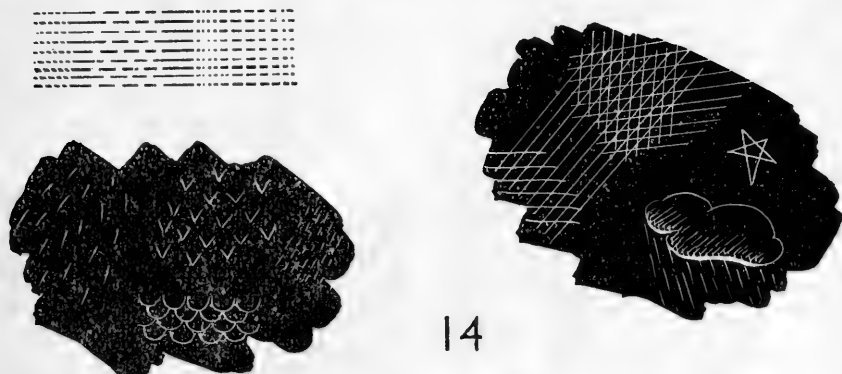
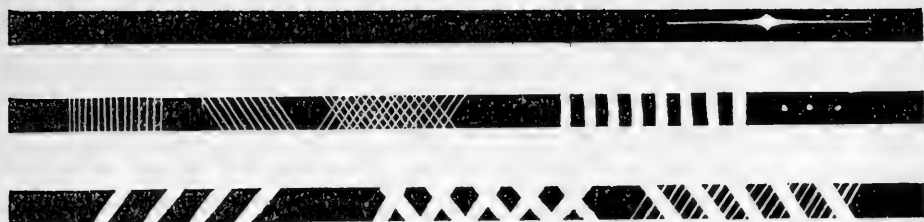
can be adapted as shown in fig. 12. The insect is staged on a white card (pinned into plasticine) above this, but as close as possible is placed a sheet of glass on which is drawn in Indian ink a grid of  $\frac{1}{4}$ " squares. Sufficient space must be left between the glass and the subject to allow it to be manipulated symmetrically under the grid. Above this, again, is placed a sheet of cardboard in the centre of which an aperture approximately  $\frac{1}{8}$ " to  $\frac{1}{4}$ " is cut. The card must be of sufficient height above the grid to permit a complete and comfortable vision of the subject. Drawing is then carried out exactly as with the squared eye-piece. The spacing between the subject, the grid and the aperture will vary from subject to subject and therefore a permanent structure is not desirable. The writer found an effective and steady structure was formed with piles of books. Fig. 13 was the author's initial attempt with this apparatus.

### SCRAPER BOARD.

This drawing medium has a good smooth, thick surface of china clay which can be scraped away, powdering finely as it is scraped and only a fine scraping need be made to remove any drawing on it. In consequence of this property it lends itself to many interesting techniques, particularly where fine white detail is needed on a black ground, this, of course, must be executed with a sharp knife. Although any sharp knife with a fine point may be used there are scraper board knives on the market. This board is not quite so easy to work on with a pen, there is a tendency for the pen to gather the clay as one works and more frequent cleaning of the pen is necessary. Therefore a brush should be used as much as possible. The board is used in the normal way except where fine white detail is needed. These areas are filled in solid black and the detail scraped out afterwards. It is essential that the black be allowed to thoroughly dry before scraping operations commence, otherwise the ink is scraped into the board and a fearful mess results. Should any scraping errors occur these can be inked in again and re-scraped. Provided the scraping is carefully done the same spot can be inked and scraped several times before the surface is exhausted.

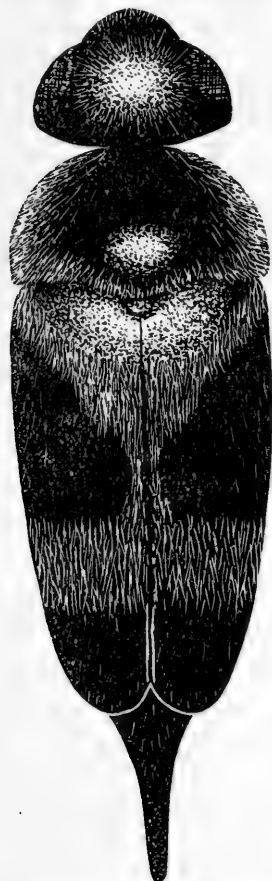
Fig. 14 gives an idea of what may be accomplished with this board. Three black bands, nine complete fine lines and two irregular black areas have been drawn in Indian ink—all the white has been inserted with a knife, no process white has been used at all; whilst fig. 15 shows a drawing which lends itself to this technique, the beetle was inked in solid except for the highlights which were left white and stipple shaded, the pubescence was inserted with a knife.

Scraper board will not bend without cracking the surface, this ruins the board and any drawing on it. Therefore it must be handled carefully and not lifted by one corner.



14

Fig. 14. Scraper board possibilities.

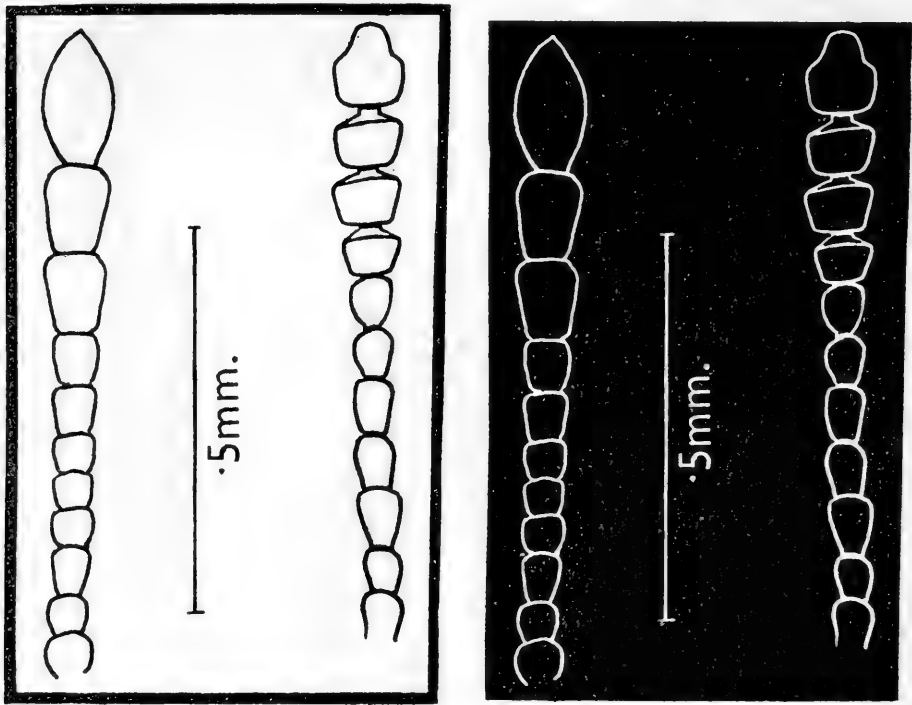


15

Fig. 15. A scraper board drawing.



Black scraper board is available but, for entomological work, its use is far more limited than white board. The work must be executed entirely with knives except for fine black detail which can be inserted with a pen. A use for black scraper board which springs to most minds is for white drawings on a black ground. This type of illustration can be produced with more ease by means of a positive reverse block. For this an ordinary drawing is produced, the limits of the background defined by means of a rectangle enclosing the figure and the drawing marked for a positive reverse. A drawing and a positive reverse of the same drawing is shown in fig. 16. The instruction that the drawing is to be positively reversed must be quite clear because a negative reverse is merely a mirror image of the original drawing.



16

Fig. 16. A drawing for reverse treatment and a reverse block made from it.

**MECHANICAL TINTS.** Where large areas are required with an even tone it may be possible to use what is known in the printing industry as a "mechanical" or "Ben Day" tint. A folder can usually be obtained from the engraver showing the various tints available and giving a reference for each one. These tints are very useful for diagrammatic figures and for distribution maps. It is possible to use each tint in two different ways—as a positive tint and as a negative tint. In general a positive tint may be recognised as a black pattern on a white background, while a negative tint is a white pattern on a black background.

However these will be indicated as such in the engraver's folder, but if no indication is given it is safe to assume them to be positive. When preparing the drawing for the engraver the areas requiring a positive tint should be filled in with a light blue wash and those requiring a negative tint with a good strong red, in each case the number or the reference of the tint must be indicated on the side of the drawing in pencil. Alternatively if it is desired to use the drawing again for other purposes tint indications and instructions can be given on a transparent overlay. Wherever the tints do not finish against a definite line in the drawing it is advisable to mark these edges with a dotted line, this will give the engraver something definite to lay the tint against—otherwise there may be some discrepancy between the drawing and the final printing which may give a false impression; particularly in distribution maps. Of course, if the actual limit of the tint is not critical the dotted line may be omitted. Fig. 17 (a) shows a diagrammatic

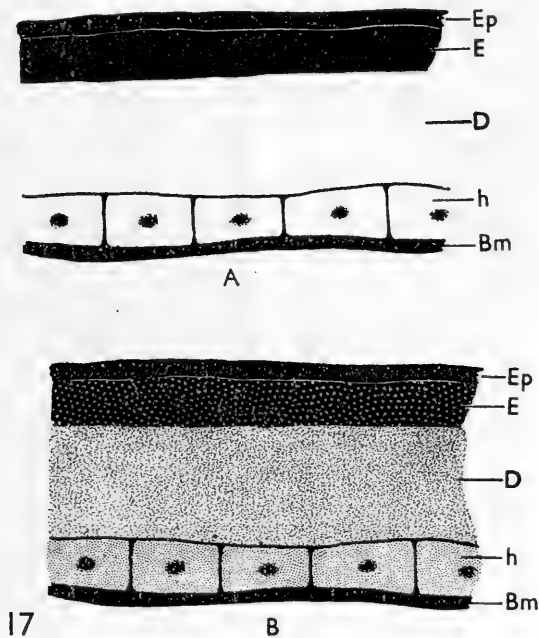


Fig. 17. Diagrammatic section of insect integument to show the use of mechanical tints. A, the original drawing; and B, the same with the mechanical tints added. Ep, epicuticula; e, exocuticula; D, endocuticula; h, hypodermis; Bm, basal membrane.

illustration as drawn (but excluding the colour washes) requiring two positive and one negative tints, and (b) the same illustration as made with the tints. Also shown is (fig. 18 a and b) a distribution map covering two species where a mechanical tint is used to show the distribution of each insect. It should be noted that where two species overlap very careful selection of the tints must be made to prevent one obliterating the other, and in these instances the instructions and indications for the tints must be given separately, one on the drawing and the other on

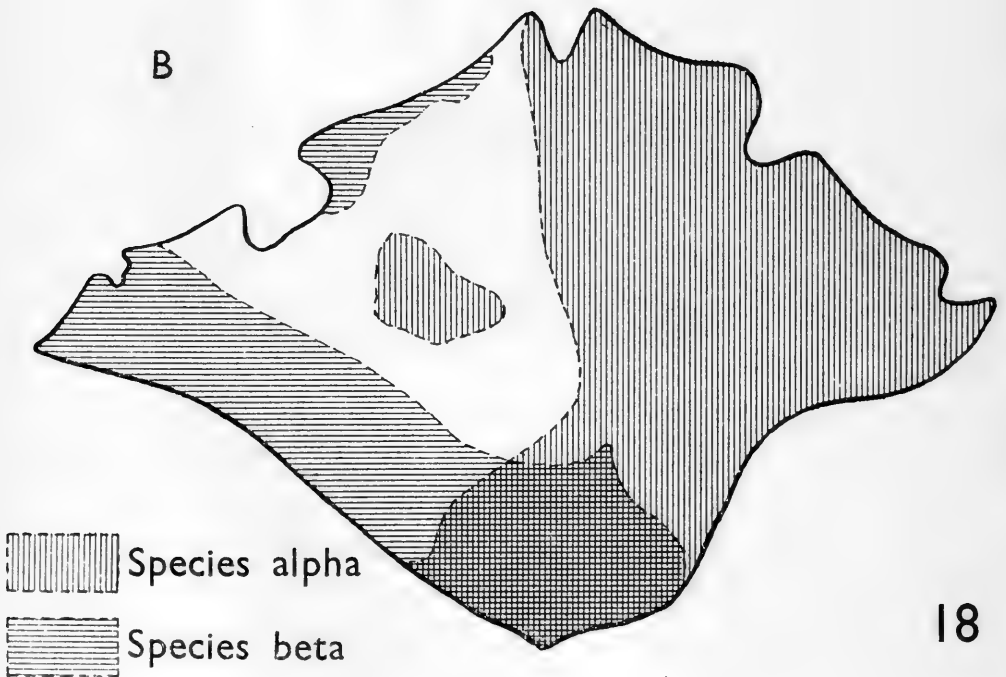
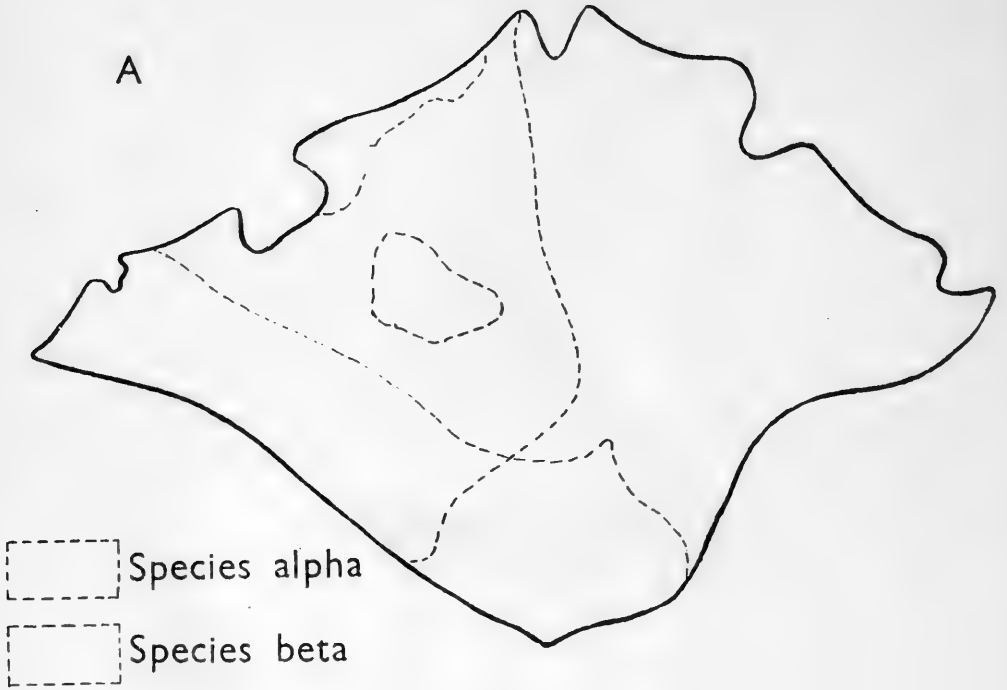


Fig. 18. A distribution map showing the use of mechanical tints. A, the drawing; and B, the same with mechanical tints laid to indicate the distribution of two species on the same map.

a transparent overlay or each on separate overlays. It is possible to obtain these tints printed on a transparent paper for pasting down on a drawing. However there is little demand for these and they may be difficult to obtain. In any case the engraver will make a much better job if allowed to lay a mechanical tint himself.

**GRAPHS.** When drawing graphs for reproduction stick to indian ink. Many graphs are supplied for reproduction executed in ordinary writing ink—these are quite useless. However to assist in making the best possible job there is no reason why graph paper should not be used. If the lines on the graph are not required in the figure when printed then the drawing should be made on that graph paper known as “blue feint” or “grey feint”. Should however the lines be required, then it must be drawn on red graph paper. When working on this type of paper always bear in mind that it will be reproduced all in black and that the lines should be drawn considerably thicker than the lines of the graph to be distinctive.

**NUMBERING AND LETTERING OF FIGURES.** The neatest and most effective way of numbering and lettering figures is to cut out suitably sized figures and letters and paste them on the drawing, where words are required it is more difficult, but may sometimes be possible. These should be clear and legible, free from fussy ornamentation. The author, in a fortunate position being employed in the industry, obtains reproduction pulls of any letters and figures he requires and always uses Gill Sans—as in the figures of this paper.

If as is most likely to be the case, this is not possible, and words, etc., have to be drawn, great care should be paid to legibility, the letters should not be drawn too small because reduction must be allowed for, and the counter, the spaces enclosed by such letters as a, o, e, P, g, should be left as open as possible to prevent them filling in. Providing the reduction is not too great the typewriter may be used, though this should only be in the last resort. It is a good plan to adjust the typewriter as for stencilling, and then insert a sheet of black (not blue) carbon paper over the paper to be typed. On most machines this will give a thinner but sharper letter.

**CALCULATION OF SIZE.** As previously explained reduction to one-third should be allowed for. It is not essential to come down as much as this, but this reduction should not be exceeded because of technical difficulties. One will know one of the dimensions to which the drawing is to be reduced and this is all that it is necessary to give the engraver, but it may be desirable to know the other dimension. To calculate this enclose the drawing in the smallest possible rectangle as in fig. 19 ABCD, and draw a diagonal from the bottom left to the top right hand corner A-C. Assuming the drawing to be reduced to a specified depth, draw a vertical line from the base line A-D to the diagonal A-C in such a position that it is exactly the specified depth, then by measuring the line E-F which must be parallel to the base line A-D, the width will be obtained. If the width is known the depth can be calculated by

reversing the procedure. Should any enlarging be required the diagonal A-C is extended beyond the rectangle ABCD and the same method employed.

**ASSEMBLING OF FIGURES INTO PLATES.** Where drawings are not to be used as text figures but are to be grouped into complete pages or plates, this is the responsibility of the author and should not be left to the editor, engraver or printer. When made up into plates the reduction will be the same for all drawings used in that plate. The size of the plate when reduced, should approximate, but not exceed, the size of the printed area of a page of text.

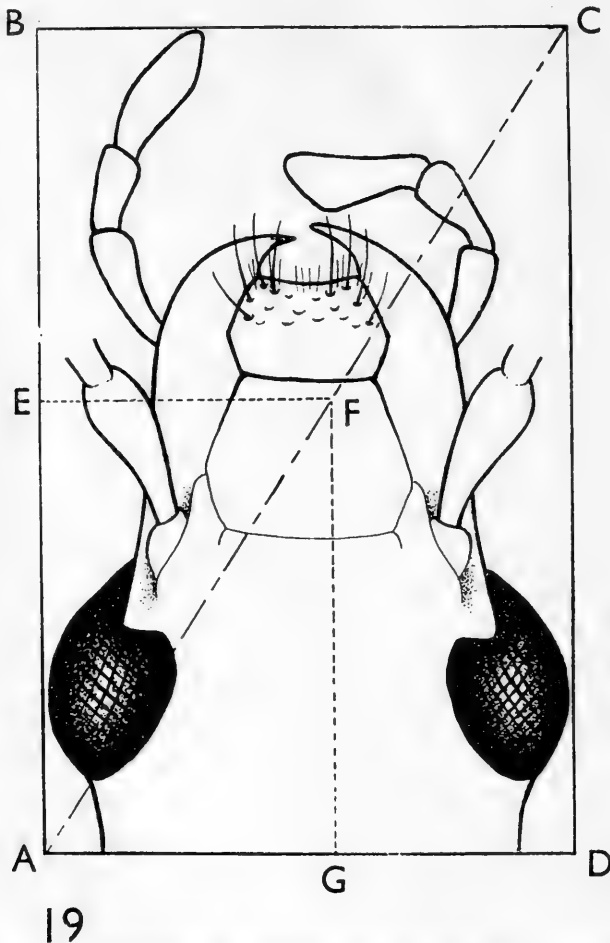


Fig. 19. Showing the method of calculating reduction.

### CONCLUSION.

Figures are an important and integral part of any paper, and where an author is capable of producing his own figures (few are not if they try), this should not be delegated to other people. Seldom does one see any part of a text of a paper given over to a second person, except in instances of co-authorship, and the only reasons which come to mind for doing so with figures, is either lack of time, which

is no reason at all, because time is found for the text of the paper; or lack of capability, which is usually more imaginary than real. Agreed there are instances when the services of a really capable artist are essential but this is not so often the case. An attempt has been made to indicate some of the less obvious pitfalls into which sometimes even the most experienced fall, due to an understandable lack of technical knowledge; also it is hoped that these notes will encourage and assist authors to illustrate their own notes and papers as fully as the subject warrants.

## GUESTS OF BRITISH ANTS.

By S. C. S. BROWN, L.D.S., R.C.S.Eng., H.D.D.Edin.

Read 8th September 1954.

In 1913 there was published a supplement to Fowler's monumental *Coleoptera of the British Islands*. This supplement, or Vol. VI, was compiled jointly by Fowler and Donisthorpe. One chapter was written solely by the latter author: *The Myrmecophilous Coleoptera of Great Britain*. Here he deals with beetles specifically attached to ants and occurring only in their nests. Later, in 1927, Donisthorpe published his *Guests of British Ants*, a work dealing at length with all Orders of insects connected directly or indirectly with ants. In his chapter in Fowler's work Donisthorpe divided the coleopterous inhabitants of ants' nests into three classes: (1) The True Guests of the ants, or those beetles sought after by the ants, fed and protected. (2) The Hostile Persecuted Lodgers, beetles whose presence is resented by the ants. (3) The Indifferently Treated Lodgers, the beetles which are tolerated and not molested or possibly not noticed. This classification can well be used in considering the status of other insects and the members of other Orders found in ants' nests. This evening only the True Guests or Class I can be discussed, although a few remarks can be made about some interesting species found in the other two classes.

As myrmecophilous animals are only found by chance outside ants' nests it is obvious that in order to study and collect them the nests of their hosts must first be found. Ants in general favour sandy heaths and commons, the borders of woods where they face east and rough stony hillsides. They avoid wet clayey flat land, but some species can be found in rotten stumps of trees and grassy hillocks in bogs and marshes. Bricks and flat stones lying on the ground, or, better still, pieces of corrugated iron, are almost sure to conceal a nest. I once found a nest of the very rare parasitic ant *Anergates atratulus* Schenck in a rusty cocoa tin, and the only British slave-making ant, *Formica sanguinea* Latr., in an empty petrol can and in an old boot. Having located a nest, it should be examined methodically and with care for its various inhabitants. The collector should provide himself with a trowel, a rubber sheet about 3 ft. square, a sieve with a rather fine mesh, some tubes, a "pooter", and a small net with a very fine silken bag. The "pooter" is a very useful piece of apparatus to pick up rapidly-moving small insects.

The sheet should be opened out near the nest and the rest of the gear laid by ready to hand. If a stone is over a nest which is about to be investigated, it should be lifted up and laid on the sheet upside down. Now examine the nest and quickly take any beetle or other insect which may be in the runs of the ants below the stone. Beetles

will very rapidly disappear or be carried by the ants down the runs. The stone on the sheet can now be examined. As soon as the outside of the nest has been checked over the whole of the nest, if it is a small one, can be dug up and thrown on to the sheet, where it can be worked through the sieve a little at a time. It is also worth-while to examine the dead leaves on grass-tufts in the immediate vicinity of the nest; special attention should be given to any small stones on its perimeter.

Lastly, the net should be swept over the nest several times and any overhanging branches of shrubs or trees lightly tapped into the net. In this way parasitic hymenoptera and other minute insects connected with the ants can be collected. The Braconid *Elasmosoma berolinense* Ruthe\* can often be seen hovering over a nest of *Formica rufa* L. if the nest has been disturbed. It is parasitic on the workers. The minute Dipteran *Pseudacteon formicarum* Verrall can be seen in a similar manner hovering over the nests of *Lasius niger* L. It is probable that many parasitic hymenoptera could be taken in this manner and a good field of research is open to anyone who would specialise in this form of collecting.

After an elapse of about an hour the collector should return and sweep once again the foliage over the nest. The beetle *Clytra quadripunctata* L. can be taken in this way in numbers sitting on the foliage above the nests of *Formica rufa* some time after the nests have been disturbed.

Needless to say, the sifted material from the nest should be returned to its original site and the stone or brick replaced. The ants will quickly rebuild the nest if they are not disturbed too often. If the searcher after myrmecophilous insects intends to return to the nest at a later date it is as well for future results to place a few tufts of dried grass or moss close to the nest half-buried in the soil. These can be removed later and shaken on to the sheet. In working the large nests of *Formica rufa* which are composed of rather coarse material a slightly different technique should be adopted. The sheet should be placed at some distance from the nest and two sieves, one coarse and one fine, should be used. It is as well to remember that a worker of this ant can eject a stream of formic acid to a height of six inches so the eyes should be protected. The hand should be thrust directly into the centre of the nest and a handful of the nesting material seized and dropped into the coarse sieve which is carried across to the sheet and worked in the usual way. The debris which has gone through the coarse sieve is then passed through the fine one. In this way most of the coarse material of the nest and many *rufa* workers are cleared from the sheet. The entomologist is now free to examine the debris at leisure and without being bitten by more than a few of the enraged inhabitants. The much rarer *Formica sanguinea* does not eject acid but can bite most vigorously. The nests which are the most profitable to work belong to the species *Formica rufa*, *Lasius flavus* F. and *L. fuliginosus* Latr.

\*Note.—According to the information in the possession of the B.M. (Nat. Hist.) this species has not, so far, been recorded for the British Isles.—C.N.H.



In the *rufa* nests will be found quite commonly the small greenish spider *Thyreosthenius biovatus* O.P.-Camb. This spider is not found at large outside the nests of this ant.

Also in *rufa* nests can be found the little shining guest ant *Formicoxenus nitidulus* Nyl. This little ant lives quite peacefully with its much larger host and makes its own nest deep inside the *rufa* nest. The males are wingless, hence there is no marriage flight. The curious little woodlouse *Platyarthrus hoffmanseggi* Briandt is never found away from ants nests and occurs in all or nearly all the nests of the British species. It is blind and is completely ignored by the ants. It is very widely spread and sometimes very common. It has been observed that if an ant colony moves from its nest to another some distance away the little woodlice will follow along the trail after the ants until they reach their new home.

In the nests of *Tetramorium caespitum* L. can be found, but very rarely, the curious ant *Anergates atratulus* Schenck. This ant commences life by being accepted as a guest and finishes by becoming a social parasite. The life history is inadequately known, but it is believed that a winged female of *atratulus* enters a nest of *caespitum* and is accepted by the workers. The workers then kill their own queen and the winged sexes and devote their lives in rearing the brood of the new queen. As there is no worker caste of *atratulus*, only male and female, the nest can only exist as long as the *caespitum* workers. The males of the parasitic ant are very strange objects. They are brownish-yellow in colour and can hardly walk. As they are wingless pairing takes place in the nest. There are some other species of ants which inhabit the nests of larger species, but which cannot be classified as parasites. *Leptothorax acervorum* F. is frequently found in or near the nests of *Formica rufa* and *F. sanguinea*. *L. nylanderi* Först. with *Lasius brunneus* Latr. and *Lasius umbratus* Nyl. will share a nest quite happily with *L. fuliginosus*. In the case of *Solenopsis fugax*, "The Thief Ant," no such amiable relations exist for this tiny ant eats the eggs and brood of other ants. It avoids destruction by making little burrows into which it can retreat and which are too small for its host to follow.

A true guest of the species belonging to the genus *Myrmica* is the larva of the Large Blue Butterfly, *Maculinea arion* L. Its life-history is now well-known, but it for long remained a mystery. The ants are very fond of a sweet secretion given off from a gland on the 11th segment of the larva. The larva feeds on Wild Thyme until August when it leaves its food-plant and wanders about until it meets a *Myrmica* worker. The ant then caresses the larva to make it exude a drop of the sweet fluid. After the meal the ant lifts up the caterpillar and carries it back to its nest. During the succeeding months the butterfly larva feeds on the eggs and brood of its host. In June it pupates to emerge two to three weeks later. Considering how abundant the species of the genus *Myrmica* are, it is surprising how rare and local *arion* is.

Of the coleoptera found in ants nests most belong to the "Indifferently Treated" or "Hostile Persecuted Lodger" groups. Of the True

Guests Donisthorpe only gives 5 species. Two species belonging to the genus *Claviger*, two belonging to *Lomechusa* Grav. (= *Atemeles*) and one to *Lomechusoides* (= *Lomechusa* Thoms. nec Grav.). *Claviger testaceus* Preys is a little blind beetle found chiefly with *Lasius flavus*, the Common Meadow ant, and sometimes in considerable numbers. It is fed, licked, and carried about by its host, and in return gives a sweet secretion from the trichomes which are situated at the base of the abdomen. This beetle is sometimes found attached to the winged females of the ant and in this way it could be carried to a new nest after the marriage flight.

The two species in the genus *Lomechusa* Grav. (= *Atemeles*), i.e. *emarginata* Payk. and *paradoxa* Grav., have each two hosts, that is to say, they pass the summer months in the nest of *Formica fusca* L. and the winter months in a nest of one of the *Myrmica* species.

These two species of Staphylinid beetles are sometimes found at large outside the nests of their hosts. This is because they pass a period of quarantine before they enter the second host's nest.

The fine Staphylinid beetle, *Lomechusoides* (= *Lomechusa* Thoms. nec Grav.) *strumosus* Fab., only occurs in the nest of *Formica sanguinea*, the Slave Making Ant. It is not, however, as widely distributed as its host. The workers lick, feed and carry about this beetle and are extremely fond of a sweet fluid secreted by a gland on either side of the abdomen. It has been said that in the nests where this beetle is common the workers spend so much time in attending to the beetle that they neglect their own brood. This ant very frequently changes its nest during the summer, carrying its brood and its slave, *Formica fusca* as well as the beetle along to the new site.

The association between ants and APHIDIDAE is so well known that only passing reference need be made here. The reason why some species of ants rarely appear on the surface is because they spend much of their time rearing and attending to the aphids which are underground on grass roots, etc. There are some forty species of Aphididae found in ants' nests in Britain, some of them are not found away from the ants.

As far as the COCCIDAE are concerned, ants treat members of this order much in the same way as they treat the APHIDIDAE, that is to say they seek out and protect the scale-insects in order to obtain the sweet fluid which is secreted from the anus.

In Britain we have six species which are truly myrmecophilous.

There is without doubt much to be learnt about the association of ants with this order for Donisthorpe discovered three of the six species and he was almost alone in this field. In fact the association of ants with other orders is a most fascinating subject, and it is surprising how few of our British entomologists have seriously studied this complex connection.

## AN INTRODUCTION TO THE BRITISH CARABIDAE.

By B. P. MOORE, D.Phil., F.R.E.S.

Read 8th December 1954.

Carabid beetles have for the most part a characteristic general appearance and as many of them are widely distributed and often abundant they are known to almost everyone. The species frequenting the cooler regions are largely terrestrial in habit and have thus earned the common title 'ground-beetles'. Tropical faunas, however, include a high proportion of arboreal species.

The family is a large one; some twenty thousand described species are listed by Csiki (1927-33) in his world catalogue and the total continues to increase at the rate of several hundred per year. Carabidae therefore account for over ten per cent. of all known Coleoptera and comprise nearly the whole of the terrestrial section of the suborder Adephaga. Indeed, the family limits were at one time even more widely placed but modern opinion favours the removal of such characteristic sections as the Cicindelidae (tiger-beetles) and Paussidae (myrmecophiles) as separate families within a superfamily, the Caraboidea. It appears doubtful, on phylogenetic grounds, whether these small sections deserve such exalted rank, but their separation is generally adopted as a matter of convenience.

The classification of so large and uniform a family as the Carabidae, even in its restricted sense, has proved a difficult task and our present knowledge of the group owes much to the classical researches of the earlier Coleopterists, Bonelli, Lacordaire, G. H. Horn, Sloane, and others. The family has long been regarded as a primitive one, in view of the persistence of many archaic characters, notably the pentamerous tarsi, the filiform antennae, and the campodeiform larvae. Much has been settled with regard to the definition of the main divisions but the value to be accorded to these divisions and the manner of their subdivision are still largely matters of opinion. Most authors are content to recognize two subfamilies, the Carabinae and the Harpalinae, and to divide these into numerous tribes of differing importance. However, Jeannel (1941-42) adopts a much more complicated system, based in part upon characters of the male genitalia, in which the 'tribes' are all elevated to the rank of families. Although undoubtedly an advance in some respects, this system has not found wide acceptance and it will not be adopted in the present paper.

Altogether, about seventy tribes of Carabidae are recognized at present, but as only twenty-five of these are represented in Britain, I shall not attempt to present a complete tribal classification but rather to draw attention to some of the more important characters which are apparent in our species. One of the most important of these characters

concerns the form of the coxal cavities, the apertures through which the leg nerves and muscles enter the thorax. Two types of middle coxal cavity occur in the Carabidae. With the first type (Fig. 1), characteristic of the subfamily Carabinae, the mesepimeron attains the boundary of the cavity, whereas with the subfamily Harpalinae, each cavity (Fig. 2) is entirely surrounded by the sternal plates. By far the larger proportion of the species (possibly ninety per cent.) belong to the latter category.

The two subfamilies may be divided further on the basis of the anterior coxal cavities. Within the Carabinae, these may be 'open' behind (Fig. 3) (Carabini, Nebriini, Notiophilini, and others) or entirely closed by the sterna (Elaphrini, Loricerini, Scaritini, and others). All Harpalinae have closed anterior cavities but these may be uniperforate (Fig. 4) or biperforate (Fig. 5). This intriguing character was discovered by Sloane (1923) and it has proved most useful in the correct placing of many difficult genera. However, it is not of any practical value for identification purposes since it necessitates the complete removal of a foreleg. The biperforate type (Licinini, Panagaeini, Chlaeniini, Brachinini, and others) would appear to be the more specialized but, curiously, all nerves and ligaments enter the prothorax through the anterior opening; the posterior one appears to be functionless.

Pubescence characters, particularly the development of fixed (so-called tactile) setae, play an important part in the classification. Generally, the antennae are pubescent, although frequently the basal joints are glabrous. The number of glabrous joints affords a useful group-character; the Harpalini invariably have two, the Pterostichini generally three, the Carabini four, and so on. Two types of distribution of fixed setae may be mentioned; the first (Fig. 11), characteristic of the Harpalini, shows but a single seta at the base of the eye (the supra-orbital seta) and a single seta on the margin of the pronotum; the second (Fig. 12), typical of the Pterostichini, shows two supra-orbital setae and both anterior and posterior pronotal setae. The small tribe Loricerini, with one representative in Britain, is characterized by the presence of long setae on the basal antennal joints, and with other tribes, the number of elytral (both discal and lateral) setae may be a useful character.

The legs of Carabidae show important divergences of form, often as a result of adaptation to special modes of life. The fossorial Scaritini, with their dentate front tibiae, are conspicuous in this respect and many plant-frequenting Lebiini have pectinate tarsal claws. All species possess a cleaning organ on the front tibiae for the purpose of removing dust particles from the antennae. With the primitive tribes (Carabini, Nebriini, and others) this organ takes the form of a simple groove between the terminal spurs (Fig. 9), whereas with the specialized groups, the outer spur has traversed the venter of the tibia to appear behind its partner and the cleaning organ appears between them as a notch with highly developed vestiture (Fig. 8). A few small tribes,

unrepresented in our fauna, possess a well-developed tibial notch unassociated with the spurs, which remain in the primitive terminal position. The males of many tribes may be recognized by their dilated front (and sometimes middle) tarsi.

The palpi are not nowadays accorded a high standing in classification since many of the differences to be seen in these organs are manifestly secondary sexual characters. The number of setae (nil, two, or more than two) on the inner side of the penultimate joint of the labial palpi is a useful group-character within certain tribes (Carabini, Harpalini, and others) and the form of the terminal joint of the maxillary palpi is of value in the Bembidiini (Fig. 6) and Panagaeini (Fig. 7).

The elytra furnish many useful taxonomic characters, mostly at generic and specific level. Such characters include the presence of marginal and discal pores, the development of the striation (particularly the scutellary stria), and the configuration of the elytral apices (truncate in the Lebiini, acuminate in most other tribes). The primitive Carabid elytron possessed, typically, eight striae and nine interstices of equal value, the primary interstices being distinguishable by the presence of setiferous pores. Many Harpalinae have departed but little from this archaic system but within the Carabinae are to be found many different types of elytral sculpture resulting from augmentation or reduction of the primitive striation. The less evolved *Calosoma* species (Fig. 17) exhibit a simple multiplication of the secondary interstices into three equal elements, i.e. a secondary flanked by two tertiaries. The primaries remain simple and only the central three bear pores. With *Carabus monilis* F. (Fig. 18) the central primaries have become granulate owing to the elevation of the portions between the pores. The pores themselves have virtually disappeared and the secondary and tertiary interstices remain unmodified as elevated ridges. *C. granulatus* L. (Fig. 19) is similar but the secondaries are wider and tertiaries obsolescent. With *C. clathratus* L. (Fig. 20) the primaries are dominated by large, metallic, foveiform pores, to give a very ornate effect. *C. auratus* L. (Fig. 21) exhibits atrophy of the secondaries and tertiaries, leaving three costiform primaries as sole ornamentation, and with *C. violaceus* L. (Fig. 22) this process is carried still further, the elytra becoming confusely cornulate without a trace of regular striation. However, there exists a rare variety of *violaceus* (*asperipennis* Lapouge) where the interstices are still traceable. *C. splendens* Ol. and other non-British species have smooth elytra with scarcely a trace of the primitive striation.

Finally, under the heading of classification characters, may be mentioned the male genitalia. These (Fig. 13) take the form of a strongly chitinized median-lobe, flanked at the base by two dissimilar, flap-like parameres. The form of the parameres is sometimes important; thus with most Sphodrini they are long and slender, whereas with many other tribes they are small and olive-shaped. With the Brachinini, one paramere completely surrounds the basal portion of the median-lobe. The form of the median-lobe, particularly the apical portion, is of great value

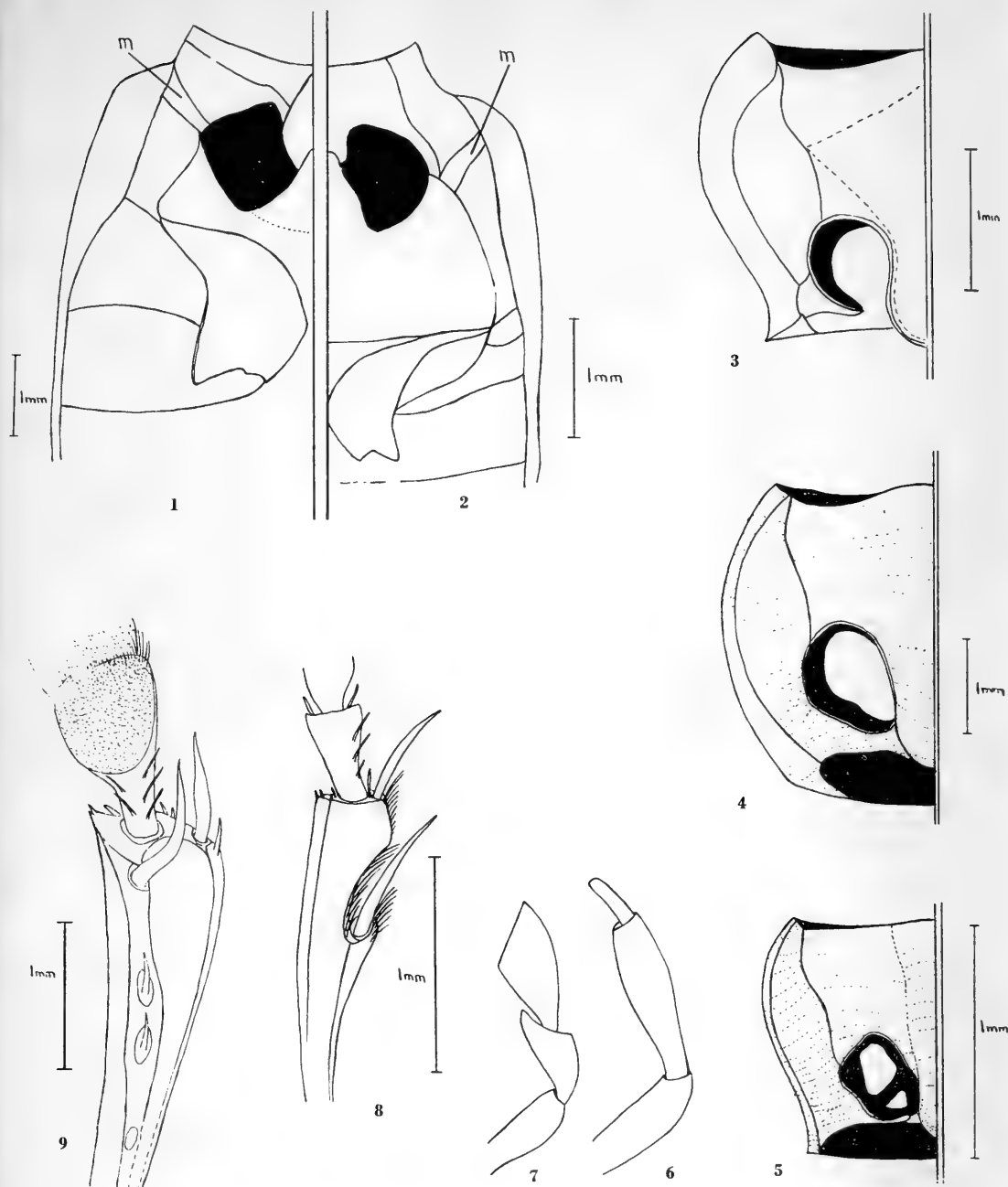


Fig. 1. Meso- and meta-sterna (right side), *Carabus nemoralis* Müll. (m, mesepimeron).

Fig. 2. The same (left side), *Harpalus rufipes* (Deg.).

Fig. 3. Prosternum (right side), *Nebria brevicollis* (F.).

Fig. 4. The same, *Pterostichus madidus* (F.).

Fig. 5. The same, *Brachinus crepitans* (L.).

Fig. 6. Maxillary palpus, *Bembidion harpaloides* Serv.

Fig. 7. The same, *Panagaeus bipustulatus* (F.).

Fig. 8. Right anterior tibia (ventral view), *Carabus nemoralis* Müll.

Fig. 9. The same, *Pterostichus madidus* (F.).





as a specific character, especially in difficult groups. Indeed, some species of *Ophonus* Steph. can scarcely be determined in any other way. The median-lobes of three species of *Harpalus* Lat. are illustrated (Figs. 13-16) as examples of the kind of interspecific variation to be expected. The apical disc is entirely wanting in certain species (*H. tenebrosus* Dej. and its allies).

The Carabidae are predominantly predacious, entirely so in the larval stages, but several large groups of species have developed omnivorous (Pterostichini) or phytophagous habits (Amarini, Zabrinini, Harpalini). *Zabrus tenebrioides* (Goeze) is well known on the Continent as a pest of cornfields, where it devours the immature grains, but it is seldom numerous enough in Britain to be more than a local nuisance.

The eggs of Carabidae are generally laid singly in the soil; the larvae are usually campodeiform (Fig. 10), sometimes blattiform (*Cychnus*). There is no key as yet for the determination of the larvae of our species for many of them are still unknown. Most of the genera are covered by van Emden (1942). A few Lebiini and Brachinini are known to have parasitic larvae. *Lebia scapularis* (Geoff.), rare in Britain, parasitizes the pupae of Chrysomelid beetles (*Galerucella* Crotch). The active first-stage larvae seek out the pupal chambers in the soil and feed rapidly upon the juices of the helpless host to become much distended with undigested food. They then moult to disclose an inactive, grub-like larva with much reduced appendages. Digestion continues without further feeding and a second moult ensues. The pupa-like third instar larva remains inactive and eventually a true pupa is disclosed, followed in about a fortnight, by the adult beetle. This interesting life-history has been cited as a case of hypermetamorphosis but it does not appear to me to be analogous to the true hypermetamorphosis of the Meloid beetles, where we have two dissimilar active larval forms separated by a pseudo-pupal stage. The *Lebia* larva retains the normal three instars of which the second and third exhibit degeneration as a result of the special mode of development.

The life-histories of the bombardier-beetles have puzzled entomologists of many generations. To date only one species (*Brachinus janthinipennis* Dej.) has been bred. This North American species, unlike its European counterparts, is a lake-shore insect and its larva parasitizes the pupae of large Gyrinid beetles (*Dineutes*). Our own *B. crepitans* (L.) will doubtless prove to have similar parasitic habits, though being mainly a chalkland insect, it is unlikely to have a water-beetle as host.

The latest list of British Carabidae (Kloet and Hincks, 1945) contains three hundred and forty-four species. Several of these (*Calosoma sycophanta* (L.), *Carabus auratus* L., *C. cancellatus* Ill.) are not indigenous but they occur from time to time as immigrants or importations from the Continent. A number of the others (*Ophonus subquadratus* (Dej.), *Lebia marginata* (Geoff.), *Brachinus sclopetata* (F.)) are of doubtful status or have not been taken for many years. On the other hand, four species (*Nebria nivalis* (Payk.) (Blair, 1950), *Badister anomalus* (Perris) (Kevan, 1955), *Perigona nigriceps* (Dej.) and *Amara*



*montivaga* (Sturm) (Allen, 1950)) have since been added to our fauna. Of these, the *Perigona* is probably an importation since it belongs to the Indian region, although now largely cosmopolitan in range. The other species are no doubt native insects which hitherto have been overlooked.

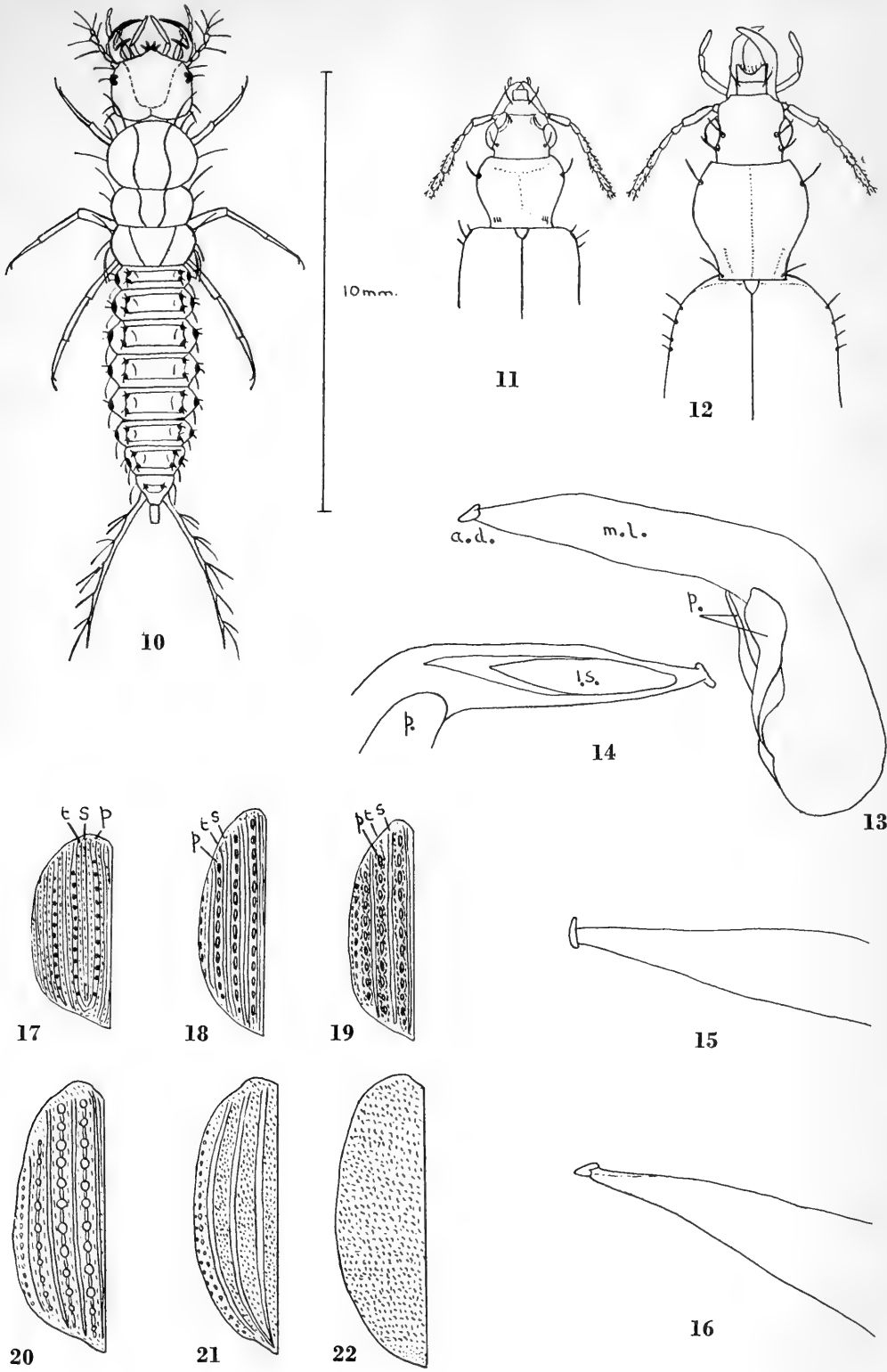
The nomenclature of our Carabidae is in an unsatisfactory state at present and is at variance with that generally adopted abroad. This position stems from proposals put forward by Andrewes, concerning the validity of certain well-known generic names. Most of the names in question were proposed by Bonelli (1809-13) in an appendix, the 'Tableau Synoptique', to his famous 'Observations Entomologiques', published originally in two parts in the memoirs of the Academy of Sciences of Turin. They have formed the basis of all subsequent systems of classification of the family. Andrewes (1919) contended, with some justification, that this appendix did not appear in the journal, since no copies now exist in which it is to be found. He concluded that it had been "annexed to the separates of his work which Bonelli distributed to his entomological friends" and he therefore rejected it as an unpublished manuscript. This action was not generally supported at the time and Bonelli's names continued to be used in Britain until the appearance, some fifteen years later, of Andrewes's alternative proposals. Continental authors have never accepted these proposals and I, myself, find little favour for them. It seems that the full facts concerning the appearance of Bonelli's work are unlikely to come to light, but we know that the separates were printed with repagination and they in fact contain an additional page introducing the 'Tableau'. Thus, they might well rank as a valid separate publication. In the interests of uniformity, I prefer to retain the Bonellian names as *nomina conservanda*, pending an opinion on the matter by the International Zoological Commission.

In conformity with general practice, the names of most of our well-known Carabid genera have been coined from Greek roots. The various derivations, some taxonomic, others geographical or mythological, form

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#### EXPLANATION OF PLATE.

- Fig. 10. Full-grown larva, *Nebria brevicollis* (F.).
- Fig. 11. Fore-parts, *Acupalpus* (*Anthracus*) *consputus* (Duft.).
- Fig. 12. The same, *Stomis pumicatus* (Panz.).
- Fig. 13. Male genitalia (left side), *Harpalus aeneus* (F.) (a.d, apical disc; m.l. median lobe; p., parameres).
- Fig. 14. The same (right side) (i.s., internal sac; p., paramere).
- Fig. 15. The same (left side), *H. smaragdinus* (Duft.).
- Fig. 16. The same, *H. rubripes* (Duft.).
- Fig. 17. Left elytron, *Calosoma inquisitor* (L.) (p., primary interstice; s. secondary; t., tertiary).
- Fig. 18. The same, *Carabus monilis* F.
- Fig. 19. The same, *C. granulatus* L.
- Fig. 20. The same, *C. clathratus* L.
- Fig. 21. The same, *C. auratus* L.
- Fig. 22. The same, *C. violaceus* L.





quite an interesting study in themselves and I have thought it worthwhile to include a small selection with their approximate translations:—

<i>Carabus</i>	.....	Name of a beetle or crab
<i>Calosoma</i>	.....	Beautiful body
<i>Notiophilus</i>	.....	Moisture-loving
<i>Leistus</i>	.....	Robber
<i>Eurynebria</i>	.....	Broad plus <i>nebria</i>
<i>Nebria</i>	.....	Deer-calf
<i>Pelophila</i>	.....	Mud-loving
<i>Elaphrus</i>	.....	Agile
<i>Panagaeus</i>	.....	All holy
<i>Badister</i>	.....	Pedestrian
<i>Callistus</i>	.....	Most beautiful
<i>Oodes</i>	.....	Egg-shaped
<i>Bradycellus</i>	.....	Slow-moving
<i>Harpalus</i>	.....	Voracious
<i>Ophonus</i>	.....	A mythological name
<i>Anisodactylus</i>	.....	Unequal fingers
<i>Pterostichus</i>	.....	Wings with striae
<i>Agonum</i>	.....	Without angles
<i>Amara</i>	.....	Derivation uncertain
<i>Sphodrus</i>	.....	Dark
<i>Tachys</i>	.....	Quick
<i>Bembidion</i>	.....	A small buzzing insect
<i>Dromius</i>	.....	A wanderer
<i>Cymindis</i>	.....	A night-hawk

The geographical distributions of our native Carabids are by no means entirely worked out but the information available does enable general conclusions to be drawn. A few species appear to be ubiquitous but the majority show well-marked zones of distribution. Four main groups may be defined as follows:—1, The boreal species, *Nebria nivalis* (Payk.), *Elaphrus lapponicus* Gyll., *Bembidion virens* Gyll., and others which, outside Britain, occur only in the arctic regions of Scandinavia and North America; 2, the boreo-alpine species, *Nebria gyllenhali* (Schön.), *Miscodera artica* (Payk.), *Harpalus 4-punctatus* Dej., and others which are essentially northern species but which occur further south in mountainous regions; 3, the central European species, *Nebria livida* (L.), *Callistus lunatus* (F.), and others which reach their western limits in eastern England; 4, the Mediterranean species, notably *Eurynebria complanata* (L.), which attain their northernmost extent in south-western England and southern Ireland. These distributional patterns have contributed much to the modern theory of land distribution during the great Pleistocene Ice Age. Three examples are plotted on the accompanying map.

Comparatively little is known concerning the ecology of our Carabidae. A number of species are known to be very restricted in habitat; for example, *Callistus* and *Brachinus* generally occur on chalk-land,

whereas *Anisodactylus poeciloides* (Steph.) and *Acupalpus elegans* Dej. are strictly salt-marsh insects. However, the reasons for these apparent preferences are by no means clear, for Lindroth (1954) has shown that the attraction is not a chemical one; the respective species show little response to changes of alkalinity, salinity, etc. Most probably, the preference is primarily one of micro-climatic conditions which are known to vary greatly with differing soil compositions. Specific predator-prey relationships no doubt play a significant part in some instances.

We have two strictly sub-marine Carabids in Britain, namely *Aëpus marinus* (Ström) and *Aëpopsis robinii* (Lab.). These minute species are to be found in fissures of rocks situated well below high-water mark, where they are accompanied by a small Staphylinid beetle, a Hemip-



The approximate distribution of three British Carabids.

*Nebria nivalis* (Payk. ● *N. livida* (L.) ○ *Eurynebria complanata* (L.) +

teron, and several species of Acarina, upon the young of which they are presumed to feed. Another Carabid with an intriguing ecology is the large, black, *Sphodrus leucophthalmus* (L.) which appears to be confined to human habitations at the present time. Presumably the species was originally an inhabitant of natural caves, although it must be admitted that it is scarcely ever found in such situations throughout its present range. There are, however, a number of other Sphodrines (all non-British) which are entirely cavernicolous—a significant fact in the circumstances.

Inevitably, I have had to pass over many points of interest but I trust that these brief notes will suffice to show how informative a study of our Carabidae can become. Much undoubtedly remains to be discovered and many life-histories will need to be investigated before our knowledge of the group can be regarded as comprehensive.

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#### OMISSION.

##### NYMPHALIS XANTHOMELAS Esper.

It is regretted that in the notes regarding this species in the 1953-54 Volume of *Proceedings and Transactions* (pages xxxiv, 35 and 51) the fact was not mentioned that the specimen in question was thought to be *N. polychloros* L., and was exhibited as such, until recognised by Mr. I. R. P. Heslop actually during the course of the Exhibition meeting of 31st October 1953, for the above species. Mr. Heslop at once called the attention of the Exhibitor and of Museum officials present at the meeting to the fact; and his determination of the species was subsequently checked and confirmed at the Museum. A note of the circumstances was published in the *Entomologist's Gazette*, Vol. 5, page 9 (January 1954).

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are held regularly at the Society's Rooms, and include the well-known ANNUAL EXHIBITION, which takes place in October in the Libraries of The Royal Society and of the Geological Society of London at Burlington House, Piccadilly, by kind permission of those two Societies. Frequent Field Meetings are held at week-ends in the Summer. Visitors are welcome at all meetings. The current Programme Card can be had on application to the Secretary.

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# THE SOUTH LONDON Entomological and Natural History Society

PEPYS HOUSE, 14 ROCHESTER ROW, WESTMINSTER, LONDON, S.W. 1

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## OBJECTS

The Society has for its objects the promotion and advancement of research in Biological Science, and its diffusion by means of meetings at the Society's Rooms for the reading of original papers, discussions and lectures, by public exhibitions, by field meetings, by the issue of publications, the formation of typical collections and of a library, and by such other means as the Council may from time to time determine.

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## MEETINGS

Indoor Meetings at Rochester Row are generally held twice monthly, on second and fourth Thursdays at 6.30 p.m. Field Meetings take place throughout the Summer.

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The Council invites the co-operation of all Naturalists, especially those who are willing to further the objects of the Society by reading papers and exhibiting specimens.

---

## COLLECTIONS, etc.

The Society possesses representative collections of most orders of insects, and an extensive library. These are available at all Ordinary Meetings. Members may borrow books at meetings or by post. Donations of suitable insects and books are much appreciated.

There is also a big collection of lantern slides, mainly of insects in all stages, from which series may be borrowed. Microscopes are available for home use

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(These apply to *all* meetings, not only to the Annual Exhibition.)

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Adequate labelling of all exhibits is essential; such labelling to include—

- (a) *name and address of exhibitor,*
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- (e) *any other information of scientific interest, such as "Gynandromorph", etc., relating to any particular specimen,*

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A report, including all the points mentioned above for labelling, and amplified to give short details of any special aberrations, gynandromorphs (e.g. left side male, right side female), or other points of interest, *must be handed to the Recorder when the exhibit is taken in (at the Annual Exhibition) or to the Editor (at Ordinary Meetings).*

*Such report must be written or typed (preferably typed) ON ONE SIDE OF THE PAPER ONLY, WITH A 2 INCH MARGIN ON THE LEFT SIDE, WITH AT LEAST DOUBLE SPACING BETWEEN LINES, in the form used for the record in the Proceedings.*

Where the author of a specific name is not known, a blank space should be left for its insertion, but every endeavour should be made to furnish this in the first instance, to avoid misunderstandings.

## INSTRUCTIONS TO SPEAKERS

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Naturally, not *all* the papers read or talks given to the Society are suitable for publication in the Transactions of the Society, and the Council, acting through the Publications Committee, reserves the right to refuse those papers it considers unsuitable.

The relevant Bye-law (26) (d) states that "all papers read or announced at any meeting and accepted for publication in the Society's publications shall become the property of the Society, unless otherwise stipulated before the reading or announcement thereof".

The Society will be very pleased to receive papers for consideration that may be suitable for reading in title. These should be sent to the Editor.

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1891	W. H. TUGWELL, Ph.C. (dec.).	1939	H. B. WILLIAMS, LL.D., F.R.E.S.
1892	C. G. BARRETT, F.E.S. (dec.).	1940	E. A. COCKAYNE, D.M., F.R.C.P., F.R.E.S.
1893	J. J. WEIR, F.L.S., etc. (dec.).	1941	F. D. COOTE, F.R.E.S. (dec.).
1894	E. STEP, F.L.S. (dec.).	1942	S. WAKELY.
1895	T. W. HALL, F.E.S. (dec.).	1943	R. J. BURTON, L.D.S., R.C.S.Eng
1896	R. SOUTH, F.E.S. (dec.).	1944	STANLEY N. A. JACOBS.
1897	R. ADKIN, F.E.S. (dec.).	1945-46	Capt. R. A. JACKSON, R.N., F.R.E.S.
1898	J. W. TUTT, F.E.S. (dec.).	1947	L. T. FORD, B.A.
1899	A. HARRISON, F.L.S. (dec.).	1948	Col. P. A. CARDEW (dec.).
1900	W. J. LUCAS, B.A., F.E.S. (dec.).	1949	J. O. T. HOWARD, M.A.
1901	H. S. FREMLIN, M.R.C.S., L.R.C.P., F.E.S. (dec.)	1950	Air-Marshal Sir ROBERT SAUNDBY, K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S.
1902	F. NOAD CLARK (dec.).	1951	T. G. HOWARTH, B.E.M., F.R.E.S., F.Z.S.
1903	E. STEP, F.L.S. (dec.).	1952	E. W. CLASSEY, F.R.E.S.
1904	A. SICH, F.E.S. (dec.).	1953	F. STANLEY-SMITH.
1905	H. MAIN, B.Sc., F.E.S. (dec.).	1954	STANLEY N. A. JACOBS, S.B.St.J., F.R.E.S.
1906-7	R. ADKIN, F.E.S. (dec.).	1955	F. D. BUCK
1908-9	A. SICH, F.E.S. (dec.).		
1910-11	W. J. KAYE, F.E.S.		
1912-13	A. E. TONGE, F.E.S. (dec.).		
1914-15	B. H. SMITH, B.A., F.E.S. (dec.).		
1916-17	HY. J. TURNER, F.E.S. (dec.).		
1918-19	STANLEY EDWARDS, F.L.S., etc. (dec.).		
1920-21	K. G. BLAIR, B.Sc., F.E.S. (dec.).		
1922	E. J. BUNNETT, M.A. (dec.).		

## LIST OF MEMBERS

(Revised to 1st June 1956)

Chief subjects of Study:—*b*, Botany; *bi*, Biology; *c*, Coleoptera; *cr*, Crustacea; *d*, Diptera; *ec. ent*, Economic Entomology; *ent*, Entomology, General; *e*, Exotic; *g*, Genetics; *hem*, Hemiptera; *hym*, Hymenoptera; *l*, Lepidoptera; *mi* Microscopy; *ml*, Micro-lepidoptera; *mo*, Mollusca; *n*, Neuroptera; *nat. hist*, Natural History; *nat. phot*, Nature Photography; *od*, Odonata; *oo*, Oology; *orn*, Ornithology; *orth*, Orthoptera; *r*, Reptiles; *rh*, Rhopalocera; *t*, Trichoptera; *z*, Zoology.

## HONORARY MEMBERS.

Including Honorary Members appointed under Bye-law 10(a), (Hon.); and Special Life Members appointed under Bye-law 10(b), (S.L.).

DATE OF APPOINT- MENT.	DATE OF JOINING	SOCIETY.	CLASS.	NAME, ADDRESS AND INTERESTS.
8.11.1950.	14. 1.1915.	Hon.	COCKAYNE, E. A., O.B.E., D.M., F.R.C.P., F.R.E.S., 8, High Street, Tring, Herts. <i>l, g.</i>	
10. 1.1951.	10. 1.1951.	Hon.	GIFFORD, WALTER S., R.F.D., No. 2, Greenwich, Connecticut, U.S.A. <i>l.</i>	
1. 1.1950.	12.10.1899.	S.L.	CARR, Rev. F. M. B., M.A., L.T.H., Martin's Close, Mudeford, Christ- church, Hants. <i>l, n.</i>	
1. 1.1951.	25. 1.1900.	S.L.	DAY, F. H., F.R.E.S., Blackwell Lodge West, Carlisle, Cumberland. <i>l, c..</i>	
1. 1.1953.	1902.	S.L.	HARE, E. J., C.B.E., F.R.E.S., Harrow Place, Pinden, Dartford, Kent. <i>l.</i>	

## LIFE, ORDINARY, AND COUNTRY MEMBERS.

YEAR OF  
ELECTION.

1951	ALLAN, P. B. M., M.B.E., M.A., F.S.A., F.R.E.S., F.Z.S., No. 4, Windhill, Bishop's Stortford, Herts. <i>l</i> .
1950	ALLEN, Miss D. M., "Cedars", Furzedown College, Wellham Road, Tooting, London, S.W.17. <i>nat. hist</i> .
1943	ALLEN, DONALD, F.R.P.S., F.R.S.A., F.R.E.S., 698, Warwick Road, Solihull, Warwickshire. <i>hym, ent, l, nat. phot, mi</i> .
1951	ALLEN, Rev. P. V. M., 78, Conway Crescent, Perivale Park, Greenford, Middx. <i>l</i> .
1953	ASAHINA, S., D.SC., Totsuka 3-chome, 123, Shinjuku-ku, Tokyo, Japan. <i>od</i> .
1953	ASHBY, G. J., F.R.E.S., c/o Zoological Society of London, Regent's Park, London, N.W.8. <i>ent</i> .

- 1950 ASHWELL, D. A., The Heights, Galloway Road, Bishop's Stortford, Herts. *g, od, hym, nat. phot.*
- 1946 ASTBURY, C. F., 21, Warwick Gardens, West Kensington, London, W.14. *l.*
- 1950 ATHERLEY, Miss M., 43, Farley Road, Derby. *l.*
- 1934 ATKINSON, J. L., No. 2, Gatcombe House, Littlehempston, Nr. Totnes, Devon. *l.*
- 1952 BAILEY, KARL E. J., 73, Botley Road, Oxford. *l.*
- 1952 BAKER, B. R., 2, St. Saviour's Terrace, Field Road, Reading. *l.*
- 1939 BAKER, Capt. D. B., R.A.O.C., F.R.E.S., c/o 7, Tabor Court, Cheam, Surrey. *l, c.*
- 1953 BAKER, J. A., B.A., The Old Vicarage, Churt, Surrey. *l, t.*
- 1947 BALFOUR-BROWNE, Prof., W. A. F., M.A., F.R.S.E., F.R.E.S., F.L.S., Brocklehurst, Collin, Dumfries. *c.*
- 1942 BANNER, JOHN V., M.R.C.S., L.R.C.P., F.R.E.S., "Wykehurst," 41, Varndean Gardens, Brighton 6, Sussex. *l.*
- 1953 BARTON, Major B. C., O.B.E., Castle Mead, Highcliffe, Christchurch, Hants. *l.*
- 1948 BAXTER, L. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1948 BAXTER, R. N., 16, Bective Road, Forest Gate, London, E.7. *l. breeding.*
- 1933 BAYNES, E. S. A., O.B.E., F.R.E.S., 2, Arkendale Road, Glengary, Co. Dublin, Eire. *l.*
- 1954 BEARD, J. W., 79a, Lansdowne Place, Hove, Sussex. *ent.*
- 1954 BEAUFOY, S., B.SC.(ENG.), A.M.I.E.E., F.R.P.S., F.R.E.S., 98, Tuddenham Road, Ipswich, Suffolk. *ent.*
- 1938 BIERNE, B. P., PH.D., F.R.E.S., F.L.S., Officer-in-Charge, Entomology Laboratory, Box 179, Belleville, Ontario, Canada. *ml.*
- 1949 BELL, C. L., F.R.E.S., 23, Harcourt Road, Redland, Bristol 6. *l.*
- 1947 BEST, A. A., 131, Woodham Lane, New Haw, Weybridge, Surrey. *l.*
- 1949 BIRKETT, NEVILLE L., M.A., M.B., B.CHIR. (CANTAB.), 3, Thorny Hills, Kendal, Westmorland. *l, c, d.*
- 1945 BLASDALE, PHILIP, 10, Quarry Hill Road, Ilkeston, Derby. *ent.*
- 1949 BLATHWAYT, C. S. H., M.A. (OXON), F.R.E.S., "Amalfi," 27, South Road, Weston-super-Mare, Somerset. *l.*
- 1948 BLAXILL, A. D., "St. Marthas," Braiswick, Colchester, Essex. *l.*
- 1942 BLEST, T., "Homestead," Higham Lane, Tonbridge, Kent. *l.*
- 1926 BLISS, A., "Golden Mist," Whitford, near Axminster, Devon. *l.*
- 1925 BLYTH, S. F. P., 6, Hatherley Road, Winchester, Hants. *l.*
- 1948 BOLINGBROKE AND ST. JOHN, THE VISCOUNTESS (née FROHAWK, Valezina), Essendene, Cavendish Road, Sutton, Surrey. *nat. hist, ent.*
- 1948 BOLTON, E. L., Lyncombe, Stagbury Avenue, Chipstead, Surrey. *l.*

- 1948 BOWATER, Lt.-Col. W., M.C., B.D.S., T.D., D.L., 41, Calthorpe Road, Edgbaston, Birmingham, 15. *l, heredity.*
- 1944 BOWDEN, S. R., B.SC., A.R.C.S., F.R.E.S., 53, Crouch Hall Lane, Redbourn, Herts. *l, g.*
- 1946 BOYCE, B., 16, Highland Road, Chichester, Sussex. *l.*
- 1948 BOYES, J. D. C., B.SC., A.R.I.C., A.R.P.S., Wimborne, Millfields, Nantwich, Cheshire. *l.*
- 1946 BRADLEY, J. D., F.R.E.S., 53, Osterley Road, Isleworth, Middx. *l.*
- 1947 BRETHERTON, R. F., C.B., M.A., F.R.E.S., Ottershaw Cottage, Ottershaw, Surrey. *l.*
- 1933 BRETT, G. A., B.SC., A.R.C.S., D.I.C., F.R.E.S., 2, Claygate Lane, Hinchley Wood, Esher, Surrey. *ent.*
- 1952 BRINDLE, ALLAN, F.R.E.S., 86, Princess Street, Nelson, Lancs. *ent.*
- 1940 BRITTEN, H., M.M., F.R.H.S., F.INST.P.A., "Newholme," 21, Toller's Lane, Old Coulsdon, Surrey. *ent (Chalcididae).*
- 1930 BROOKE, Miss W. M. A., F.L.S., 300, Philip Lane, London, N.15. *ec. ent, b, marine life.*
- 1954 BROWN, F. C., F.Z.S., 6, Osmond Gardens, Wallington, Surrey. *Giant Silk Moths.*
- 1943 BROWN, S. C. S., L.D.S., R.C.S.ENG., H.D.D.EDIN., 142, Richmond Park Road, Bournemouth, Hants. *ml, hym.*
- 1952 BRUSH, H. J., "Larkspur", West Farm Close, Ashtead, Surrey. *ent.*
- 1952 BRYOE, D., The Bungalow, Cliffe, Gt. Harwood, Blackburn, Lancs. *l, dip.*
- 1936 BUCK, F. D., *Vice-President* and *Hon. Editor*, 36, Besant Court, Newington Green Road, London, N.1. *c.*
- 1955 BUCKLER, H. A., Sutton Bassett, Market Harborough, Leics. *l, ml.*
- 1927 BULL, G. V., B.A., M.B., "White Gables" Sandhurst, Kent. *l.*
- 1946 BURKHARDT, Col. V. R., late R.A., D.S.O., O.B.E., 86, Main Street, Stanley, Hong Kong. *l.*
- 1944 BURNS, B. S., 1, Jamaica Villas, Stoke Road, Gosport, Hants. *l.*
- 1948 BURTON, P. J., L.D.S., R.C.S.ENG., F.R.E.S., "Paysanne," Godshillwood, near Fordingbridge, Hants. *l.*
- 1938 BURTON, R. J., L.D.S., R.C.S.ENG., Cosey Dene, Blackminster, Evesham, Worcs. *l.*
- 1947 BUSBRIDGE, W. E., Firwood, 4, Mount Harry Road, Sevenoaks, Kent. *l.*
- 1922 BUSHBY, L. C., F.R.E.S., "Leeside", Challock Lees, nr. Ashford, Kent. *c, hem.*
- 1953 BUTTERFIELD, A. W., 124, Ashville Road, Leytonstone, London, E.11. *l.*
- 1951 BYERS, F. W., 59, Gurney Court Road, St. Albans, Herts. *l.*
- 1953 CADBURY, Mrs. BETTY, 78, Oakley St., Chelsea, London, S.W.3. *l.*
- 1948 CALDERARA, P., A.M.I.E.E., "Stratton Lodge," 26, Manor Road, Barnet, Herts. *l, c.*



## ELECTION.

- 1945 CARLIER, STUART E. W., F.R.E.S., 6, Warwick Buildings, Warwick Road, Solihull, Warwickshire. *l, c.*
- 1950 CAROLSFELD-KRAUSE, A. G., Slotsherrens Have 97, (Kobenhavn)-Vanlose, Copenhagen, Denmark. *l.*
- 1946 CARTER, R. A., 60, West Street, Dorking, Surrey. *c.*
- 1946 CHALMERS-HUNT, J. M., F.R.E.S., 70, Chestnut Avenue, West Wickham, Kent. *l.*
- 1945 CHARLSON, S., 89, Market Street, Stalybridge, Cheshire. *l, ent, g.*
- 1956 CHATELAIN, R. G., 65, East Drive, St. Mary Cray, Kent. *l.*
- 1952 CHEVALLIER, L. H. S., 95, Muswell Hill Road, London, N.10. *l.*
- 1952 CHRISTIE, J., 137, Gleneldon Road, Streatham, S.W.16. *d.*
- 1945 CHRISTIE, L., *Lanternist and Recorder*, 137, Gleneldon Road, Streatham, S.W.16. *ent.*
- 1954 CLARK, J., 7, Park Road, Bognor Regis, Sussex. *ent.*
- 1951 CLARKE, C. ASTLEY, M.D., F.R.C.P. (Lond.), High Close, Thorsway, Caldby, Cheshire. *l.*
- 1936 CLASSEY, E. W., F.R.E.S., 22, Harlington Road East, Feltham, Middlesex. *l.*
- 1934 COLE, G. A., M.A., F.C.A., Highfield, Westhumble, Dorking, Surrey.
- 1953 COLERIDGE, W. L., Ess Hill, Ashburton Road, Newton Abbot, S. Devon. *ent, orn.*
- 1946 COLLIER, Major A. E., M.C., B.A., Lynher, Horsham Rd., Cranleigh, Surrey. *l.*
- 1936 COOPER, B. A., B.SC., A.R.C.S., F.R.E.S., Entomology Dept., Shardlow Hall, Shardlow, Derby. *c (Elateroidea), ecology, ec. ent, l, nat. phot. (Life Member).*
- 1923 CORK, C. H., 11, Redesdale Street, Chelsea, London, S.W.3. *l.*
- 1947 CORNELIUS, J. A., 29, Grangecliffe Gardens, South Norwood, London, S.E.25. *l.*
- 1922 COUCHMAN, L. E., F.R.E.S., 35, Browne Street, West Hobart, Tasmania. *l.*
- 1909 COULSON, F. J., "Burnigill", 24, Springfield Avenue, Merton Park, London, S.W.20. *c, hem, l.*
- 1918 COURT, T. H., F.R.G.S., "Oakleigh," Market Rasen, Lincoln.
- 1947 COX, W. A. A., 65, Bamford Road, Bromley, Kent. *ent.*
- 1950 COXEY, S., 203, Green Lane, Bolton, Lancs. *l.*
- 1953 COXON, G. F., Crosby, Drive Spur, Kingswood, Surrey. *ent, nat. hist.*
- 1934 CRASKE, J. C. B., F.R.E.S., 33, Hinchley Drive, Hinchley Wood, Esher, Surrey. *l.*
- 1937 CRASKE, R. M., 22, Edge Street, Campden Hill, London, W.8. *ent.*
- 1918 CRAFTURD, CLIFFORD, "Denny," Bishop's Stortford, Herts. *l.*
- 1933 CREWDSON, R. C. R., F.R.E.S., "The Grange," Delamere, Northwich, Cheshire. *l.*
- 1947 CRIPPS, C. H., M.A., Bulls Head Farm, Eakley Lanes, Stoke Goldington, Newport Pagnell, Bucks. *l, rh. (Life Member.)*

## ELECTION.

- 1949 CROSS, G. S. E., A.C.T.S.INC., 31, Avenue Road, Finchley, London, N.12. *l.*
- 1932 CROW, P. N., F.R.E.S., Ravensdale, Ockham Drive, Ockham Road, East Horsley, Surrey. *l.*
- 1950 CRUTTWELL, G. H. W., Old Ford House, Frome, Somerset. *ent.*
- 1954 CUE, P., "Lhasa," Malvern Road, Ashford, Kent. *ent.*
- 1947 CUNNINGHAM, D., M.A., 42, Rae Street, Dumfries. *l, flora.*
- 1950 CURL, B. J. A., 33, Fair Oak Road, Bishopstoke, Eastleigh, Hants. *l.*
- 1946 CURRIE, P. W. E., M.C., F.R.E.S., The Platte, Ackleton, Wolverhampton. *hym, orth.*
- 1937 CURTIS, A. E., F.R.E.S., "The Cottage," Ifold Estate, Loxwood, Billingshurst, Sussex. *l.*
- 1946 CURTIS, W. PARKINSON, F.R.E.S., M.S.B.E., Ladywell Cottage, Tower Road, Branksome Park, Bournemouth, Hants. *l.*
- 1956 DACIE, J. V., M.D., 10, Alan Road, Wimbledon, S.W.19. *l.*
- 1951 DALY, D. W., P.O. Box 1670, Salisbury, Southern Rhodesia. *ent.*
- 1927 DANBY, G. C., "Sheringham", 53, Albion Road, Sutton, Surrey. *l.*
- 1945 DAVIDSON, A. R., 2, Foster Road, Formby, Liverpool. *l, c.*
- 1951 DAVIS, G. A. N., M.R.C.S., L.R.C.P., Holt Wood, Aylesford, Kent. *l.*
- 1933 DEMUTH, R. P., M.A., L.R.I.B.A., Hardwicke, Glos. *l.*
- 1930 DENVIL, H. G., F.Z.S., F.R.H.S., 4, Warwick Road, Coulsdon, Surrey. *l, c.*
- 1947 DEWICK, A. J., Curry Farm, Bradwell-on-Sea, Southminster, Essex. *l.*
- 1945 DIXON, C. H., Northbrook Farm, Micheldever, Hants. *ent.*
- 1921 DOLTON, H. L., 36, Chester Street, Oxford Road, Reading, Berks. *l.*
- 1930 DUDBRIDGE, B. J., B.A., c/o The Secretariat, Dar-es-Salaam, Tanganyika. *ent.*
- 1949 DUFFIELD, C. A. W., M.C., J.P., F.R.E.S., Pickersdane, Brook, near Ashford, Kent. *l, c, hem, homoptera.*
- 1946 DUNBAR, J. G., Royal Commission, Ancient and Historic Monuments (Scotland), 3, South Bridge, Edinburgh 1. *l.*
- 1950 DUNK, H. C., 24, Abbots View, Abbots Rise, Kings Langley, Herts. *l.*
- 1952 DYSON, R. C., N.D.H., F.R.E.S., 112, Hollingbury Park Avenue, Brighton 6, Sussex. *l.*
- 1927 EAGLES, T. R., *Hon. Librarian*, 32, Abbey Road, Enfield, Middlesex. *l, c.*
- 1937 EASTON, N. T., D.F.H., Westbury, West End Road, Mortimer, Berks. *l, g, nat. phot.*
- 1949 EDWARDS, F. H., Rockfield, Abbey Road, Worthing, Sussex. *l.*
- 1945 EDWARDS, G. GRAVELEY, Talbot Croft, St Albans, Herts. *l.*
- 1945 EDWARDS, R. C., Arlesley, Pilgrims' Way, Westerham, Kent. *ent.*
- 1941 EDWARDS, Rev. Canon T. G., M.A., F.Z.S., 93, Alleyn Park, Dulwich, London, S.E.21.

## ELECTION.

- 1933 ELGOOD, W. S., M.A., North Brink, Wisbech, Cambs. *l*.
- 1951 ELLISON, ELDON F. D., Youl Grange, Link Road, Eastbourne, and Clifton College, Bristol. *l*.
- 1945 ELLISON, R. ELDON, F.R.E.S., Youl Grange, Link Road, Eastbourne. *l*.
- 1937 EMBRY, B., F.R.E.S., Brocks Ghyll, Newick, Sussex. *l*.
- 1932 ENNIS, L. H., F.C.A., Southery, Milbourne Lane, Esher, Surrey. *l*.
- 1947 EVANS, Miss E., c/o Royal Entomological Society of London, 41, Queen's Gate, London, S.W.7.
- 1945 EVANS, L. J., 73, Warren Hill Road, Birmingham 23. *l*.
- 1946 FAIRCLOUGH, R., "Blencathra," Deanoak Lane, Leigh, Surrey. *ent*.
- 1947 FARWELL, I. G., F.R.E.S., "Mayfield Villa," Portmore, Lymington, Hants. *l*.
- 1955 FEARNEHOUGH, T. D., A.MET., 13, Salisbury Road, Dronfield, Nr. Sheffield. *l*.
- 1947 FEILDEN, G. ST. CLAIR, B.M./N.L.B.G., London, W.C.1. *ent*.
- 1946 FERGUSON, L. F., L.D.S., R.C.S., "Harley House," Gloucester Road, Teddington, Middlesex. *c*.
- 1930 FERRIER, W. J., F.R.E.S., 86, Portnalls Road, Coulsdon, Surrey. *l*.
- 1940 FFENNELL, D. W. H., Martyr Worthy Place, Winchester, Hants. *l*.
- 1955 FIRMIN, JOSEPH, 23, Creffield Road, Colchester, Essex. *l*.
- 1943 FORD, E. B., M.A., D.SC., F.R.S., F.R.E.S., The University Museum, Oxford. *ent, g*.
- 1920 FORD, L. T., B.A., 28, Park Hill Road, Bexley, Kent. *l*.
- 1939 FORSTER, H. W., 32, Park Mead, Harlow, Essex.
- 1915 FOSTER, T. B., "Downlands", 24, York Road, Selsdon, Surrey. *l*.
- 1948 FRASER, Lt.-Col. F. C., I.M.S.RETD., M.D., M.R.C.S., L.R.C.P., F.R.E.S., 55, Glenferness Avenue, Winton, Bournemouth, Hants. *od, n*.
- 1952 FRASER, R. A., The Foundry Cottage, Ramsbury, Wilts. *l, c*.
- 1948 FRAZER, J. F. D., B.M., B.CH., Stone House, Harbourland, Boxley, Maidstone, Kent. *l*.
- 1946 FRIEDLEIN, A. F. E., "St. Andrews", 85, Priests Lane, Shenfield, Brentwood, Essex. *l*.
- 1951 FROHAWK, Mrs. M. J., Essendene, Cavendish Road, Sutton, Surrey. *ent, nat. hist*.
- 1947 GARDNER, A. E., F.R.E.S., *Hon. Curator*, 29, Glenfield Road, Banstead, Surrey. *od, l*.
- 1952 GARLAND, W. A., 1, Testard Road, Guildford, Surrey. *rh*.
- 1955 GATES, M. D. C., 5, Garden Close, Banstead, Surrey. *l*.
- 1954 GERARD, B. McC., 68, Fern Lane, Heston, Hounslow, Middx. *ent*.
- 1950 GENT, P. J., 3, Union Road, Wellingborough, Northants. *l*.
- 1952 GILLMAN, Lt.-Col. H. C. R., M.B.E., R.A., Noads House, Tilshead, Wilts. *ent*.
- 1950 GOATER, B., 71 Grant's Close, Mill Hill East, N.W.7. *l*.

## ELECTION.

- 1936 GOODBAN, B. S., 99, Lime Grove, Eastcote, Ruislip, Middx. *l*.
- 1935 GOODLIFE, F. D., M.A., Lord Wandsworth Agricultural College, Long Sutton, Basingstoke, Hants. *ec. ent.*
- 1942 GOODSON, A. L., 26, Park Road, Tring, Herts. *l*.
- 1955 GOOSEMAN, M. P., F.R.E.S., "Lonicera", Bottesford Road, Bottesford, Scunthorpe, Lincs. *l, c*.
- 1926 GORDON, D. J., B.A., F.R.E.S., Table Office, House of Commons, London, S.W.1. *c, l*.
- 1949 GOULD, A. W., *Council*, 109a, Shooters Hill Road, Blackheath, S.E.3. *c*.
- 1936 GOWING-SCOPES, E., F.R.E.S., "Oakhurst", Oakwood Road, Crofton, Orpington, Kent. *c*.
- 1924 GRANT, F. T., 45, Hastings Road, Maidstone, Kent. *l, c*.
- 1951 GREEN, J. A., 61, Brewery Road, Plumstead, London, S.E.18. *l*.
- 1950 GREENWOOD, K. C., M.B., CH.B., "Rydal," 1, Conyers Avenue, Birkdale, Southport, Lincs. *l, ml*.
- 1953 GRIFFITHS, G. C. D., F.R.E.S., 13, Woodlands Avenue, Finchley, London, N.3. *d (Agromyzidae)*
- 1950 GULLY, J. G., Howells Bank Farm, Ringmer, Sussex. *l*.
- 1955 GURDON, J. B., Furnell House, Frensham, Surrey. *l*.
- 1947 HAGGETT, G. M., F.R.E.S., 1, Torton Hill, Arundel, Sussex. *l, ent*.
- 1953 HALL, D. G., 34, Ellerton Road, Wandsworth Common, London, S.W.18. *c*.
- 1949 HALL, STEWART SCOTT, C.B., M.SC., F.R.A.E.S., Head of British Joint Services Mission (Technical Services), 1800K Street N.W., Washington, D.C.
- 1955 HALSTEAD, D. G. H., 1, Barry Avenue, Windsor, Berks. *c*.
- 1944 HAMMOND, H. E., F.R.E.S., 16, Elton Grove, Birmingham 27. *l, ent*.
- 1949 HANSON, S. M., F.R.E.S., 167, Gunnersbury Park, Ealing, London, W.5. *l (Life Member)*
- 1948 HARBOTTLE, The Rev. A. H. H., M.A., 6, Ranelagh Grove, St. Peters, Broadstairs, Kent. *l*.
- 1943 HARDS, C. H., F.R.E.S., 40, Riverdale Road, Plumstead, London, S.E.18. *l*.
- 1943 HARPER, Comdr. G. W., R.N., F.R.E.S., Neadaich, Newtonmore, Inverness-shire, Scotland. *l*.
- 1954 HARPER, M. W., Neadaich, Newtonmore, Inverness-shire, Scotland. *l, ent*.
- 1936 HARRIS, W. H. A., "Kemel," Oak Tree Close, Stanmore, Middlesex. *l*.
- 1951 HARRISON-GRAY, M., 16, Carlton House Terrace, London, S.W.1. *Saturniidae*.
- 1953 HARVEY, J. G., 109, Burton Road, London, S.W.9. *c*.
- 1924 HARWOOD, P., F.R.E.S., Wyrley, Colehill, Wimborne, Dorset. *l, c*.
- 1927 HAWGOOD, D. A., 2, Kingsmead Road, Tulse Hill, London, S.W.2. *l*.

## ELECTION.

- 1924 HAWKINS, C. N., F.R.E.S., 23, Wilton Crescent, Wimbledon, London, S.W.19. *l, c, g.*
- 1938 HAYNES, R. F., *Council*, 29, Fairfield Drive, Dorking, Surrey. *l.*
- 1923 HAYWARD, Capt. K. J., F.R.E.S., F.Z.S., F.R.G.S., Instituto Miguel Lillo, Calle Miguel Lillo, 205, Tucuman, Republica Argentina. *l, orn, c.*
- 1954 HEATH, JOHN, F.R.E.S., c/o The Nature Conservancy, Merlewood Research Station, Grange-over-Sands, Lancs. *ml.*
- 1935 HEDGES, A. V., F.R.E.S., "Ballavale", Santon, Isle of Man. *l.*
- 1920 HEMMING, A. FRANCIS, C.M.G., C.B.E., F.Z.S., F.R.E.S., 28, Park Village East, Regents Park, London, N.W.1. *l.*
- 1924 HENDERSON, J. L., *Hon. Treasurer*, 6, Haydn Avenue, Purley, Surrey. *c.*
- 1951 HERBULOT, C., 31, Av. d'Eylau, Paris 16e, France. *l.*
- 1954 HERVEY, The Rev. Canon G. A. K., M.A.(OXON.), Great Salkeld Rectory, Penrith, Cumberland. *ent, orn, b.*
- 1945 HESLOP, Mrs E. A., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l. nat. hist.*
- 1931 HESLOP, I. R. P., M.A., F.R.E.S., "Belfield," Poplar Road, Burnham-on-Sea, Somerset. *l, nat. hist.*
- 1946 HEWSON, F., F.R.E.S., 23, Thornhill Drive, Gaisby, Shipley, Yorks. *l, hym. parasitica.*
- 1948 HICKIN, N. E., PH.D., B.SC., F.R.E.S., Home Farm, Fetcham, Surrey. *t.*
- 1948 HILLABY, J. D., F.Z.S., F.R.E.S., 85, Cholmley Gardens, London, N.W.6. *ent.*
- 1945 HINTON, H. E., PH.D., B.SC., F.R.E.S., Department of Zoology, Bristol University, Bristol, Glos.
- 1949 HOARE-WARD, J. W., Box's Farm, Horsted Keynes, Sussex. *l.*
- 1953 HODGKINSON, ALEXANDER, A.R.C.A., 12, Kitson Road, Barnes, London, S.W.13. *l.*
- 1943 HOLLEBONE, Comdr. L. H. T., O.B.E., R.N., F.R.E.S., Mombasa Institute of Muslim Education, P.O. Private Bag, Mombasa, Kenya.
- 1946 HOLROYD, GEORGE C., "Silver Birches," 8, Elmside, Onslow Village, Guildford, Surrey. *l.*
- 1956 HOMER, T. J. G., M.A., A.M.INST.T., Yelton Hotel, Hastings, Sussex. *l.*
- 1950 HONEYBOURNE, T. J., F.R.E.S., "Laceys," 97, Birchwood Road, Wilmington, Dartford, Kent. *l.*
- 1955 HORNABROOK, R. W., CH.B., M.R.A.C.P., Nuffield Foundation House, 34, Leinster Gardens, London, W.2. *c.*
- 1945 HOWARD, A. P., 65 Hale Lane, London, N.W.7. *ent.*
- 1927 HOWARD, J. O. T., M.A., Wycherley, Deepdene Wood, Dorking, Surrey. *l.*
- 1953 HOWARTH, Mrs. HELEN, "Arrochar", Barnet Gate, Arkley, Herts. *l, b.*

## ELECTION.

- 1931 HOWARTH, T. G., B.E.M., F.R.E.S., F.Z.S., "Arrochar", Barnet Gate, Arkley, Herts. *l*.
- 1934 HUGGINS, H. C., F.R.E.S., 65, Eastwood Boulevarde, Westcliff-on-Sea, Essex. *l, ent*.
- 1952 HUMPHREY, J. C., R.N., Woodside, Chiddingly, Lewes, Sussex. *c*.
- 1947 HUMPHREY, S. W., Pear Tree House, Roade, Northamptonshire. *l, rh. (Life Member)*.
- 1933 HUTCHINGS, H. R., 127, Chadacre Road, Stoneleigh, Surrey. *l*.
- 1950 HYDE, G. E., F.R.E.S., 20, Woodhouse Road, Doncaster, Yorks. *l, od*.
- 1953 HYDE, R. A., "Woodside," Reading Road, Finchampstead, Berks. *c*.
- 1950 HYDE-WYATT, B., 108, Lindsay Road, Worcester Park, Surrey. *od, c, l*.
- 1955 ILES, PETER, 62, Ingle Avenue, Morley, Leeds, Yorks. *l*.
- 1953 IVES, Major D. H., R.A., 9, St Michaels Road, Colchester, Essex. *l*.
- 1940 JACKSON, Capt. REGINALD A., C.B.E., R.N., F.R.E.S., Middle Farm House, Codford St. Mary, Warminster, Wilts. *ent, l*.
- 1923 JACOBS, S. N. A., S.B.ST.J., F.R.E.S., *Trustee and Council*, "Ditchling," 54, Hayes Lane, Bromley, Kent. *ml, e.ml*.
- 1955 JACOBY, M. C., 22, Birdhurst Road, South Croydon, Surrey. *ent*.
- 1956 JAMES, B. C., 31, Mainwaring Road, Lincoln. *l*.
- 1948 JANSON, D. B., 44, Great Russell Street, London, W.C.1. *ent. (Life Member)*.
- 1925 JARVIS, C. MACKECHNIE, F.L.S., Sussex House, Parkside, Wimbledon. *c*.
- 1938 JARVIS, F. V. L., B.SC., F.R.E.S., "Corbière", 33, Greencourt Drive, Bognor Regis, Sussex. *l, g*.
- 1947 JAY, E. P., Surrey Cottage, Littlehampton, Sussex. *l*.
- 1951 JEFFERSON, T. W., 37, Riversdale Terrace, Sunderland, Co. Durham. *l*.
- 1948 JEFFS, G. A. T., Nunsholme, Nuns Corner, Grimsby, Lincs. *l, ent*.
- 1945 JOHNSON, Major-General G. F., C.B., C.B.E., D.S.O., Castlesteads, Brampton, Cumberland. *l, orn*.
- 1952 JOPSON, F. L., Langdale, Higherford, Nelson, Lancs. *l*.
- 1946 KEMP, J. K. C., 12, Nab Wood Crescent, Shipley, Nr. Bradford, Yorks. *l*.
- 1943 KERSHAW, Col. S. H., D.S.O., Alderman's Place, Aspley Heath, Bletchley, Bucks. *l*.
- 1928 KETTLEWELL, H. B. D., M.A., M.B., B.CHIR., M.R.C.S., L.R.C.P., F.R.E.S., Dept. of Zoology, University Museum, Oxford. *g, l*.
- 1952 KINDRED, A. D., 27, Richmond Avenue, Bedfont, Middlesex. *l*.
- 1947 KLIMESCH, J., Donatusgasse 4, Linz-a-Donau, Austria. *ml*.
- 1944 KLOET, G. S., F.Z.S., F.R.E.S., 14, Hawthorne Lane, Wilmslow, Cheshire. *ent*.

## ELECTION.

- 1955 KLOTS, Prof. ALEXANDER B., B.S., M.S., PH.D., 215, Young Avenue, Pelham, New York, U.S.A. *l*, *Systematics*, *Ecology*
- 1952 KNIGHT, F., 90, Mitford Road, Holloway, London, N.19. *l*.
- 1951 LANE, A. W., 178, Ravenscroft Road, Beckenham, Kent. *c*.
- 1947 LANFEAR, A. H., "Highclere," 20, South Eastern Road, Ramsgate. Kent. *l*.
- 1945 LANG, R. M., A.C.A., 85, Cheam Road. E. Ewell, Surrey. *l*.
- 1951 LANGMAID, J. R., 9, Craneswater Park, Southsea, Portsmouth, Hants. *l*.
- 1941 LAST, H. R., F.R.E.S., 12, Winkworth Road, Banstead, Surrey. *c*, *l*.
- 1946 LATHAM, F. H., F.R.E.S., "The Elms," Mapleborough Green, Redditch, Worcs. *l*.
- 1927 LAWSON, H. B., "Churchmead," Pirbright, Surrey. *l*.
- 1952 LEECH, M. J., "The Spinney," Freshfield Road, Formby, Nr. Liverpool. *l*, *c*.
- 1914 LEEDS, H. A., 3, Beville, Wood Walton, Huntingdon. *l*.
- 1952 LEES, F. H., F.R.E.S., "The Gables," Maidencombe, Torquay. *l*.
- 1952 LEGROS, A. E., 155, Glenfarg Road, Catford, S.E.6. *hym.*, *arachnidae*.
- 1948 LESTON, D., F.Z.S., F.R.E.S., 44, Abbey Road, London, N.W.8. *hem.* (*Life Member*.)
- 1947 LEWIS, E., F.R.E.S., 8, Parry Road, South Norwood, London, S.E.25. *c*.
- 1934 LINE, H. V., 11, Priory Avenue, Petts Wood, Orpington, Kent.
- 1951 LING, R. B., The Severells, Rectory Lane, Sidcup, Kent. *l*.
- 1933 LIPSCOMB, Brigadier C. G., Misterton, Somerset. *l*.
- 1937 LISNEY, A. A., M.A., M.B., F.R.E.S., "Dune Gate," Clarence Road, Dorchester, Dorset. *l*.
- 1948 LLEWELYN, Mrs. J. R., B.SC. (HORT.), F.R.E.S., 38, Fernleigh Rise, Ditton, Maidstone, Kent. *ent*.
- 1948 LOCKINGTON, N. A., M.A., A.R.I.C., 19, Spring Grove, Loughton, Essex. *ent*.
- 1948 LORIMER, R. I., 8, Southway, Totteridge, N.20. *l*.
- 1950 LOVELL, R., 27, Athenaeum Road, Whetstone, London, N.20. *l*.
- 1954 LYON, F. H., M.B.E., F.R.E.S., Green Headland, Sampford Peverell, Tiverton, Devon. *l*.
- 1953 McCLURE, A. M., Bowyers Court, Wisborough Green, Sussex. *l*.
- 1952 McCRAE, A. W. R., Oak Lawn, Gordon Avenue, Stanmore, Middlesex. *l*.
- 1950 McDERMOTT, Miss C. A., "The Dene," Borough Green, Kent. *rh*.
- 1952 MACKWORTH-PRAED, C. W., F.R.E.S., Castletop, Burley, Hants. *ent*.
- 1949 MACNICOL, D. A. B., M.B., CH.B., 52, St Albans Road, Edinburgh 9. *l. ml*.
- 1931 MACNULTY, B. J., PH.D., B.SC., F.R.I.C., Ministry of Supply Tropical Testing Establishment, Port Harcourt, Nigeria. *l*.
- 1949 MANLEY, G. E. L., Chalvington House, Nr. Hailsham, Sussex. *l*.



- 1945 MANLEY, Lt.-Col. W. B. L., F.R.E.S., *President*, Greenways, Shoreham Rd., Otford, Kent. *ent.*
- 1956 MANLEY, Mrs. W. B. L., Greenways, Shoreham Road, Otford, Kent. *l.*
- 1956 MANSELL, G. H., 20, Norfolk Mansions, London, S.W.11. *l.*
- 1932 MARCON, Rev. J. N., Christ Church Vicarage, Seaside, Eastbourne, Sussex. *l.*
- 1930 MARSH, Capt. DUDLEY G., "White Gates", Wingham Rd., Littlebourne, Nr. Canterbury, Kent. *l.*
- 1956 MARSH, Capt. J. C. S., c/o Lloyds Bank Ltd., Cox's & King's Branch, 6, Pall Mall, S.W.1. *l.*
- 1950 MARTIN, E. L., 9, Devonshire Road, Harrow, Middlesex. *l, t.*
- 1922 MASSEE, A. M., O.B.E., D.S.C., F.R.E.S., East Malling Research Station, Kent. *hem, c, acarina.*
- 1955 MATTHEWS, D. P. L., T.D., Flat 5, 51, Cadogan Place, London, S.W.1. *l.*
- 1947 MAXWELL, Sir REGINALD M., M.A., G.C.I.E., K.C.S.I., Barford House, St Mary Bourne, Andover, Hants. *ent.*
- 1951 MAY, J. T., Homeland, Beech, Alton, Hants. *l.*
- 1950 MAY, R. M., Berkely Lodge, Highfields, Ashted, Surrey. *l.*
- 1946 MELLOWS, CHARLES, Alliot House, The College, Bishop's Stortford, Herts. *l, hym.*
- 1952 MENZIES, I. S., "Eden Roc", Florida Road, Ferring-by-Sea, Sussex. *c, l, orth.*
- 1946 MERE, R. M., F.R.E.S., *Council*, Mill House, Chiddingfold, Surrey. *l.*
- 1951 MESSENGER, J. L., B.A., "Oakhill", Oatlands Drive, Weybridge, Surrey. *l.*
- 1951 MICHAELIS, H. N., 10, Didsbury Park, Didsbury, Manchester 20. *l.*
- 1945 MICHAUD, J., PH.D., 22, Routh Road, London, S.W.18. *ent.*
- 1938 MINNION, W. E., 40, Cannonbury Avenue, Pinner, Middlesex. *l.*
- 1952 MONTGOMERY, Major J. R. P., M.C., 17 Parachute Bn. (9D.L.I.) T.A., Burt Terrace Drill Hall, Gateshead, Co. Durham. *l.*
- 1946 MOORE, B. P., B.S.C., PH.D., F.R.E.S., *Vice-President*, "Montrose", Stoneyfields, Farnham, Surrey. *od, c.*
- 1947 MOORE, D. R., Sunnyside Cottage, Westcar Lane, Hersham, Surrey. *l. (Life Member).*
- 1947 MOPPETT, A. A., B.A., 39, Fairdale Gardens, Hayes, Middlesex. *ent.*
- 1951 MORE, D., The Little House, Hockley Road, Rayleigh, Essex. *ent.*
- 1949 MORGAN, H. D., F.R.E.S., 3, Ten Acre Wood, Margam, Port Talbot, Glam. *ent.*
- 1920 MORISON, G. D., B.S.C., PH.D., F.R.E.S., Dept. Advisory Entomology, N. of Scotland Agricultural College, Marischal College, Aberdeen, Scotland. *ec. ent.*
- 1930 MORLEY, A. M., O.B.E., M.A., F.R.E.S., 9, Radnor Park West, Folkestone, Kent. *l.*



- 1953 MORRIS, M. G., F.R.E.S., "Old Timbers," 57, St. Mary's Avenue, Shortlands, Kent. *l*.
- 1945 MURRAY, Rev. D. P., F.R.E.S., The Lodge, Stoke Golding, Nr. Nuneaton, Warwick. *l*.
- 1949 NEWMAN, D. E., 4, Andrew Road, Wallingford, Berks. *l*.
- 1926-36 and 1945 NEWMAN, L. HUGH, F.R.E.S., Chestnut House, Cold Blow, Bexley, Kent. *l*.
- 1950 NEWTON, J., B.S.C., 11, Oxlease Close, Tetbury, Glos. *l*.
- 1945 NEWTON, J. L., M.R.C.S., L.R.C.P., F.R.E.S., H.M. Prison, Brixton, S.W.2. *l, b*.
- 1930 NIBLETT, M., F.R.E.S., 10, Greenway, Wallington, Surrey. *galls*.
- 1953 NISSEN, C. L., Flat 10, 250, South Norwood Hill, London, S.E.25. *l*.
- 1955 NOBLE, F. A., 2, Newton Road, Sparkhill, Birmingham, 11. *l*.
- 1938 ODD, D. A., F.Z.S., F.R.E.S., Greenbank, Shepherds Hill, Buxted, Nr. Uckfield, Sussex. *l*.
- 1932 O'FARRELL, A. F., B.S.C., A.R.C.S., F.R.E.S., New England University, Armidale, N.S.W., Australia. *od, cr, ent*.
- 1934 OLIVER, G. B., "Corydon", Amersham Road, Hazlemere, High Wycombe, Bucks. *l*.
- 1943 OLIVER, G. H. B., "Corydon," Amersham Road, Hazlemere, High Wycombe, Bucks. *l*.
- 1952 OLSEN, E. T., Hersegade 5, Roskilde, Denmark. *ml*.
- 1945 OWEN, GODFREY V., Orford, 63, Manor Park Road, West Wickham, Kent. *l*.
- 1951 OWERS, D. E., "Woodstock", Durfold Wood, Plaistow, Billingshurst, Sussex. *l, c, od*.
- 1942 PARFITT, R. W., "Penpethy", Manor Rd., Farnborough, Hants. *l*.
- 1946 PARMENTER, L., F.R.E.S., 94, Fairlands Avenue, Thornton Heath, Surrey. *d*. (*Life Member*.)
- 1948 PARRY, J. A., F.R.E.S., "Cavendish", North Holmes Road, Canterbury, Kent. *l, c*.
- 1949 PARSONS, R. E. R., F.R.E.S., I.P., Woodlands Lodge, Woodlands Close, Ottershaw, Surrey. *l*.
- 1950 PAYNE, J. H., 10, Ranelagh Road, Wellingborough, Northants. *rh, breeding*.
- 1940 PAYNE, R. M., 8, Hill Top, Loughton, Essex. *c, od, orth, b*. (*Life Member*.)
- 1953 PEACEY, A. F., Hillside, Brimscombe, Stroud, Glos. *ml*.
- 1955 PEARSON, A. J. R., Dower Cottage, Feering, Colchester, Essex. *rh*.
- 1940 PELHAM-CLINTON, EDWARD C., F.R.E.S., 34, Craigmillar Park, Edinburgh, 9. *l*.
- 1928 PERKINS, J. F., B.S.C., F.R.E.S., 95, Hare Lane, Claygate, Surrey. *hym*.
- 1944 PERRY, K. M. P., 15, Roundwood Way, Banstead, Surrey. *c*.
- 1950 PETERS, WALLACE, M.B., B.S., M.R.C.S., L.R.C.P., F.R.E.S., 175, Lauderdale Mansions, London, W.9. *ent, l*.

- 1946 PHELPS, C. C., M.B.E., 4, Queensberry House, Friars Lane, Richmond, Surrey. *l*.
- 1945 PHILPOTT, V. W., F.R.E.S., Rose Cottage, Watergate Lane, Broadmayne, Dorset. *l*.
- 1933 PINNIGER, E. B., F.R.E.S., "Littlecote", 19, Endlebury Road, Chingford, London, E.4. *od, n, l*.
- 1949 PLATTS, J. H., Green Shutters, Manthorpe Road, Grantham, Lincs. *l*.
- 1947 POLACEK, V. B., Brandys-nad-Labem, c.p. 601, 1 patro, Komen-skeho-ulice, Czechoslovakia. *b, ent, orn*.
- 1933-40, 1950 POOLES, S. W. P., 154, Thorpe Road, Peterborough, Northants. *l*.
- 1949 POPHAM, W. J., 89, Frederick Place, Plumstead, London, S.E.18. *l*.
- 1955 POTTER, N. B., The Mill House, North Warnborough, Hants. *l*.
- 1953 POUNCE, A. G., Laurel Villa, Meopham, Kent. *ent*.
- 1950 PRICE, G. C., "Alpha," 67, Cornyx Lane, Solihull, Warwickshire. *l*.
- 1948 PRICHARD, R., "Lincona," Woodcroft Lane, Bebington, Cheshire. *l, ml*.
- 1948 PRIDEAUX, A. G., B.A., Union Club, Carlton House Terrace, London, S.W.1. *ent (rh), orn*.
- 1945 PUREFOY, J. BAGWELL, c/o Upper Tilt Works, Cobham, Surrey. *l*.
- 1947 QUARRINGTON, C. A., A.M.BRIT.I.R.E., "Pennyfields," Bagshott Road, Chobham, Surrey.
- 1922 RAIT-SMITH, W., F.Z.S., F.R.E.S., F.R.H.S., *Trustee*, "Hurstleigh," Linkfield Lane, Redhill, Surrey. *l*.
- 1946 RANSOME, Major-General A. L., C.B., D.S.O., M.C., The Close, Braishfield, Romsey, Hants. *rh*.
- 1955 RAVEN, C. E., D.D., D.SC., F.B.A., F.L.S., 10, Madingley Road, Cambridge. *l*.
- 1953 RAWLINGS, C. J., "Muristan", Berther Rd., Emerson Park, Hornchurch, Essex. *l*.
- 1946 RAY, H., Mill House Cottage, Bishopstoke, Hants. *rh*.
- 1955 REDGRAVE, A. C. R., 47, Swanmore Road, Boscombe, Bournemouth. *l*.
- 1952 REID, J. F., 19, High Street, Leighton Buzzard, Beds. *l*.
- 1950 REID, W., A.M.I.C.E., 6, Whirlow Park Road, Sheffield 11, Yorks. *ent*.
- 1953 RENFREW, C., F.R.I.C.S., F.A.I., Lanhill, Bourton-on-the-Water, Glos. *l*.
- 1952 RICHARDS, A. W., M.A., B.SC., "Oriol", Court Moor Avenue, Fleet, Hants. *od, orth, l, ml, Pyralidae*.
- 1945 RICHARDS, Prof. O. W., M.A., D.SC., F.R.E.S., *Council*, Department of Zoology, Imperial College of Science and Technology, South Kensington, London, S.W.7. *ent*.
- 1948 RICHARDSON, A. E., 391, Malden Road, Worcester Park, Surrey. *l*.
- 1942 RICHARDSON, AUSTIN, M.A., F.R.E.S., Beaudesert Park, Minchin-hampton, Glos. *l*.

- 1936 RICHARDSON, N. A., 11, Windsor Street, Bletchley, Bucks. *l*.
- 1908 RILEY, Capt. N. D., C.B.E., F.R.E.S., F.Z.S., 7, McKay Road, Wimbledon, London, S.W.20. *l*.
- 1953 RIORDAN, B. D., 75, Blenheim Road, North Harrow, Middlesex. *c*.
- 1953 RIVERS, C. F., 98, Windsor Road, Cambridge. *l* (*virus diseases of lep. larvae*).
- 1910 ROBERTSON, G. S., M.D., "Struan", Storrington, near Pulborough, Sussex. *l*.
- 1949 ROBINSON, H. S., F.R.E.S., Lower Farringdon, Alton, Hants. *l*.
- 1954 ROBINSON, P. J. M., B.Sc., A.M.I.C.E., Homestead, Sandy Down, Nr. Lymington, Hants. *l*.
- 1951 ROBSON, J. P., 10, Vane Road, Barnard Castle, Co. Durham. *l*.
- 1953 ROCHE, C. G., A.C.A., 80, Princes Gate Mews, London, S.W.7. *hym*.
- 1942 ROCHE, P. J. L., M.R.C.S., L.R.C.P., F.R.E.S., c/o D.M.S., Lagos, Nigeria. *c, hem, e.l*.
- 1954 ROGERS, G. B., 70, Faraday St., Hull, Yorks. *c, l*.
- 1953 ROSE, IAN C., "Shrublands", Mistley, Essex. *ent*.
- 1932 RUDLAND, W. LEWIS, F.R.E.S., 452, Hythe Road, Ashford, Kent. *l*.
- 1947 RUMSEY, F., 46, Warren Road, Banstead, Surrey. *l*.
- 1949 RUNGE, C., 11, St. Andrews Road, Caversham, Reading, Berks. *l, hym*.
- 1952 RUSSWURM, A. D. A., F.R.E.S., 1, Langley Oaks Avenue, Sanderstead, Surrey. *l*.
- 1950 RYLE, G. B., DIP.FOR.(OXON.), "Caio," Alders Road, Reigate, Surrey. *Forest ent, hem*.
- 1946 SAUNDBY, Air-Marshal Sir ROBERT H. M. S., K.C.B., K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S., Oxleas, Burghclere, near Newbury, Berks. *l*.
- 1947 SAUNDERS, J. M. K., 22, Francis Road, Pinner, Middlesex. *l* (*especially rh*).
- 1945 SAUNT, J. W., A.L.S., "Riverview," Minerva Road, East Cowes, I.O.W. *hym, ent*.
- 1956 SCHOFIELD, Wing Comdr. C. H., Headley Hill, Bordon, Hants. *l, b*.
- 1927 SCOTT, Col. E., D.S.O., M.D., S.B.ST.J., "Suomi," Westwell, Ashford, Kent. *l*.
- 1952 SCUDDER, G. G. E., B.Sc., F.R.E.S., 1, Eltham Cottages, Station Road, Longfield, Dartford, Kent. *hem*.
- 1948 SCULTHORP, A. H., 46, Pick Hill, Waltham Abbey, Essex. *c*.
- 1946 SELF, K. W., 53b, Earls Avenue, Folkestone, Kent. *ent*.
- 1923 SEVASTOPULO, D. G., F.R.E.S., c/o Ralli Bros., Ltd., P/O Box 881, Mombasa, Kenya. *l* (*Life Member*).
- 1951 SHAW, R. G., 5, Barnham Road, Chingford, London, E.4. *l, hem*.
- 1947 SHORT, H. G., M.Sc., "Leaholme", 8, Milbourne Lane, Esher, Surrey. *l*.
- 1954 SHOWLER, A. J., M.Sc., 19, Harvel Crescent, Abbey Wood, London, S.E.2. *l*.

## ELECTION.

- 1948 SIGGS, L. W., 10, Repton Road, Orpington, Kent. *l*.
- 1939 SIVITER SMITH, P., F.R.E.S., 21, Melville Hall, Holly Road, Edgbaston, Birmingham, 16. *l*.
- 1948 SMALL, H. M., Armeria, Waterloo Lane, Skellingthorpe, Lincs. *l, od*.
- 1952 SMITH, A., 23, First Avenue, Heworth, York. *l, c*.
- 1954 SMITH, D. N. K., 35, Princes Ave., Woodford Green, Essex. *l, Saturniidae*.
- 1953 SMITH, D. S., F.R.E.S., 87, Willingdon Road, Eastbourne, Sussex. *l*.
- 1941 SMITH, Lieut. FDK. WM., R.N.V.R., South Fawley Cottage, Wantage, Berks. *l, hym. (Life Member)*.
- 1920-25 and 1939 SMITH, S. GORDON, F.L.S., F.R.E.S., "Estyn," Boughton, Chester. *ent*.
- 1946 SOUTHWOOD, T. R. E., PH.D., B.SC., A.R.C.S., F.R.E.S., Imperial College Field Station, Silwood Park, Sunninghill, Nr. Ascot, Berks. *ent, hem, c, ecology*.
- 1949 SPENCER, K. A., B.A., F.R.E.S., 11, Christchurch Hill, London, N.W.3. *l, dip*.
- 1947 SPERRING, A. H., *Council*, Slindon, Fifth Avenue, Warblington, Hants. *l*.
- 1950 SPITTLES, C. E., 95, Tring Road, Aylesbury, Bucks. *l*.
- 1943 SPREADBURY, W. H., *Council*, 35, Acacia Grove, New Malden, Surrey. *nat. hist*.
- 1920-32 and 1938 STAFFORD, A. E., "Corydonis", 83, Colborne Way, Worcester Park, Surrey. *l*.
- 1953 STALLWOOD, B. R., 19, Southfield Gardens, Strawberry Hill, Twickenham, Middlesex. *l*.
- 1949 STANLEY, F. C., F.R.E.S., "Swanmore", Bowes Hill, Rowlands Castle, Hants. *l, c*.
- 1927 STANLEY-SMITH, F., *Council*, "Hatch House", Pilgrims Hatch, Brentwood, Essex. *l*.
- 1954 STANNERS, Comdr. L. S., R.N.Z. NAVY, "Westhanger Place," Westbrook Road, Godalming, Surrey. *l*.
- 1937 STEDALL, H. P. P., Chiltern Manor, Great Missenden, Bucks. *ent*.
- 1942 STIDSTON, Eng. Capt. S. T., R.N., F.R.E.S., "Ashe," Ashburton, Devon. *l*.
- 1955 STOCKLEY, R. E., 18 Leighton Gardens, Sanderstead, Surrey. *l*.
- 1952 STORACE, LUCIANO, Museo Storia Naturale, Via Brigata Liguria, 9, Genoa, Italy. *l*.
- 1924 STOREY, W. H., Fairstead, Long Road, Cambridge. *ent*.
- 1945 STOUGHTON-HARRIS, G., M.A., F.C.A., F.R.E.S., "Rosegarth", Waldens Road, Horsell, Woking, Surrey. *ent*.
- 1948 STRUTHERS, F. M., 143a, Gander Green Lane, Cheam, Surrey. *l*.
- 1929 STUBBS, G. C., Egremont House, Ely, Cambs., and Survey Office, Kuala Lumpur, Malaya.
- 1939 SUMMERS, E. J., 45, Mulgrave Road, Sutton, Surrey. *c, hem*.

- 1934 SUTTON, GRESHAM R., 6, Kenilworth Gardens, Loughton, Essex.  
*l, c.*
- 1950 SWAIN, H. D., M.A., F.R.E.S., 47, Dryburgh Road, Putney,  
S.W.15. *l, hy, c, hem.*
- 1950 SYMES, H., M.A. (OXON), 52, Lowther Road, Bournemouth, Hants. *l.*
- 1916 SYMS, E. E., F.R.E.S., F.Z.S., 22, Woodlands Avenue, Wanstead,  
London, E.11. *n, orth, od, t.*
- 1942 TALBOT DE MALAHIDE, THE LORD, Malahide Castle, Dublin,  
Ireland. *l.*
- 1922-44 and 1952 TAMS, W. H. T., F.R.E.S., 20, Ranelagh Avenue,  
Fulham, London, S.W.6. *ent.*
- 1950 TAYLOR, A. S., 364, Burley Road, Leeds 4. *l.*
- 1941 TAYLOR, H. G. W., 11, Old Forge Way, Sidcup, Kent. *l.*
- 1925 TAYLOR, J. SNEYD, M.A., F.R.E.S., P.O. Box 597, Port Elizabeth,  
South Africa. *l.*
- 1949 TEMPLE, MISS VERE, F.R.E.S., King's Chase, Tollard Royal, Salis-  
bury, Wilts. *l, hym, orth, od.*
- 1952 THORN, MISS B. A., "Paviott", 16, Springfields, Broxbourne,  
Herts. *l.*
- 1952 THORNTON, J., 43, Barnes Street, Clayton-le-Moors, Accrington,  
Lancs. *l.*
- 1946 THORPE, JOHN, F.R.E.S., Perrivale, Elmore Lane, Quedgeley,  
Glos. *l, c, b.*
- 1950 THORPE-YOUNG, D. W., A.I.A.C., F.Z.S., 11, Waverley Way, Car-  
shalton Beeches, Surrey. *ent.*
- 1945 TIMMS, C., F.R.E.S., 524a, Moseley Road, Birmingham 12. *d.*
- 1953 TORLESSE, Rear Admiral A. D., C.B., D.S.O., Trentham, Burton  
Joyce, Notts. *l.*
- 1948 TORSTENIUS, STIG, Celsiusgatan 7, Stockholm K, Sweden. *l.*
- 1950 TROUGHT, TREVOR, M.A., F.R.E.S., Brookland, Tysoe, Warwick-  
shire. *l.*
- 1948 TRUNDELL, E. E. J., Sedge Cottage, Golf Club Road, Hook Heath,  
Woking, Surrey. *ent, l.*
- 1948 TUBBS, Mrs M., 9, Lingfield Road, Wimbledon Common, S.W.19.  
*rh.*
- 1947 TUBBS, R. S., O.B.E., F.R.I.B.A., 9, Lingfield Road, Wimbledon  
Common, S.W.19. *rh.*
- 1934 TUNSTALL, H. G., *Council*, 11, St. James Avenue, Ewell, Surrey. *l.*
- 1940 TURNER, A. D., 19, Manor Close, Kingsbury, London, N.W.9. *ent.*
- 1948 TURNER, A. H., F.Z.S., F.R.E.S., F.R.MET.S., Forest Drove, Bicken-  
hall, Hatch Beauchamp, Taunton, Somerset. *ent, insect  
migration, conchology. (Life Member.)*
- 1944 TURNER, H. J., "Casita," 240, Iford Lane, Southbourne, Nr.  
Bournemouth, Hants. *l.*
- 1943 TURNER, J. FINCHAM, 20, Kenley Walk, N. Cheam, Surrey. *l, hym.*
- 1953 TWEEDIE, M. W. F., M.A., C.M.Z.S., Raffles Museum, Singapore 6,  
Malaya. *l.*

## ELECTION.

- 1952 UFFEN, R. W. J., 4, Vaughan Avenue, Stamford Brook, W.6.  
*l, hym, d.*
- 1945 VALENTINE, ARTHUR, 5, Vicars Close, Wells, Somerset. *ent.*
- 1922-24, 1937-41, 1947 VALLINS, F. T., A.C.I.I., F.R.E.S., *Hon. Secretary*,  
4, Tattenham Grove, Tattenham Corner, Epsom, Surrey  
*Lycaenidae. (Life Member.)*
- 1951 VARLEY, Prof. G. C., M.A., PH.D., F.R.E.S., F.Z.S., Hope Dept. of  
Entomology, University Museum, Oxford. *hym, d.*
- 1951 VIETTE, P. E. L., Paris Museum (Entomology), 45 bis, R. de Buf-  
fon, Paris 5, France. *l.*
- 1955 VIVIAN, R. S. A., 143, St. Albans Road, Barnet, Herts. *l.*
- 1949 WADE, D., 17, Waldegrave Avenue, Holderness Road, Hull, Yorks.  
*l, orn.*
- 1929-31 and 1944 WAINWRIGHT, CHARLES, B.SC., F.R.I.C., 42, St. Ber-  
nards Road, Olton, Warwickshire. *l.*
- 1911 WAKELY, Sir LEONARD D., K.C.I.E., C.B., 37, Marryat Road, Wim-  
bledon, London, S.W. 19. *l.*
- 1947 WAKELY, L. J. D., O.B.E., M.A., Cottingley, Anderson Road,  
Madras. *l.*
- 1930 WAKELY, S., 26, Finsen Road, Ruskin Park, London, S.E.5. *l.*
- 1951 WALKER, D. H., B.SC. (ENG.), 90, Whytecliffe Road, Purley,  
Surrey. *l.*
- 1953 WALLIS, J. L. P., A.R.I.C.S., Kingswood Hotel, Gillingham, Kent.  
*ent, l.*
- 1935 WALLIS-NORTON, Capt. S. G., 2 Victoria Mansions, Eastbourne,  
Sussex. *ent. (Life Member.)*
- 1956 WARD, W. J. V., B.A., A.R.C.SC., "Haslemere", 23, Darlington  
Road, Stockton-on-Tees, Durham. *l.*
- 1936 WARRIER, R. EVERETT, 99, Braidwood Road, London, S.E.6. *l.*
- 1939 WATKINS, N. A., M.A., F.R.E.S., Soldon, Druid Road, Stoke Bishop,  
Bristol 9, Glos. *l.*
- 1945 WATKINS, O. G., F.R.E.S., 20, Torr View Avenue, Peverell,  
Plymouth, Devon. *l, od.*
- 1920 WATSON, D., "Woodend," Lower Road, Fetcham, Leatherhead,  
Surrey. *l.*
- 1945 WATSON, R. W., F.R.E.S., 15, Halstead Road, Bitterne Park,  
Southampton, Hants. *l.*
- 1926-27, 1928-38, 1948 WATTS, W. J., F.R.E.S., 115, Leigham Court  
Drive, Leigh-on-Sea, Essex. *c.*
- 1947 WEAL, R. D., 124, Marmion Avenue, South Chingford, London,  
E.4. *c.*
- 1945 WEBB, HARRY E., F.R.E.S., 20, Audley Road, Hendon, London,  
N.W.4. *l.*
- 1945 WEDDELL, B. W., 13, The Halve, Trowbridge, Wilts. *ent.*
- 1911 WELLS, H. O., "St Hilary," 4, Boleyn Avenue, East Ewell, Sur-  
rey. *l.*
- 1953 WEST, B. B., 1, Pond Square, London, N.6. *l, od.*

## ELECTION.

- 1947 WEST, B. K., Branksea, 193, Shepherd's Lane, Dartford, Kent. *l.*
- 1945 WHEELER, A. S., 26, Ashurst Road, Tadworth, Surrey. *l.*
- 1948 WHICHER, L. S., F.R.E.S., A.I.A.E.E., 6, Chisholm Road, Richmond, Surrey. *c.*
- 1949 WHITE, Miss E. M. S., DIP. HORT. (READING), F.R.H.S., County Education Office, County Hall, Ipswich, Suffolk. *agric. ent, nat. hist.*
- 1954 WHITEHEAD, J., 16, Westbourne Arcade, Bournemouth, Hants. *l.*
- 1946 WHITEHORN, K. P., F.R.E.S., "Spindles", Windsor Road, Gravesend, Kent. *l.*
- 1953 WIFFEN, R. C. G., 12, Girdlers Road, London, W.14. *c.*
- 1920-30, 1955 WIGHTMAN, A. J., F.R.E.S., 67, The Spinney, Pulborough, Sussex. *l (noctuae)*
- 1946 WILDRIDGE, W., "Flavion", Penn Road, Park Street, Nr. St. Albans, Herts. *ent.*
- 1955 WILKINSON, C., "Sandbank", Thurlestone, Nr. Kingsbridge, S. Devon. *l.*
- 1947 WILKINSON, W., 21, Highfield Avenue, Goldthorpe, Nr. Rotherham, Yorks. *l.*
- 1947 WILLIAMS, Mrs D. M., "Warley Lea," Brentwood, Essex. *l.*
- 1945 WILLIAMS, E. F., F.R.E.S., "Warley Lea," Brentwood, Essex. *l.*
- 1947 WILLIAMS, E. P., "Warley Lea," Brentwood, Essex. *l, od.*
- 1925 WILLIAMS, H. B., Q.C., LL.D., F.R.E.S., West Moushill, Milford, Nr. Godalming, Surrey. *l, g.*
- 1948 WILLIAMS, L. H., PH.D., B.SC., 31, Armour Road, Tilehurst, Reading, Berks. *ent.*
- 1932 WILLIAMS, S. W. C., 17, Beresford Road, Chingford, London, E.4. *l.*
- 1951 WOOD, E. F., 18, Nursery Road, Prestwich, near Manchester, Lancs. *l.*
- 1927 WORMS, C. G. M. DE, M.A., PH.D., F.R.I.C., F.R.E.S., M.B.O.U., Council, "Three Oaks", Shore's Road, Horsell, Woking, Surrey. *l, orn.*
- 1955 WRIGHT, DAVID, Whitehill House, Whitehill, Bordon, Hants. *l.*
- 1949 WRIGHTSON, A. L., 93, Morse Street, Lower Brunshaw, Burnley, Lancs. *l.*
- 1945 WYKES, N. G., Carter House, Eton College, Windsor, Berks. *l.*
- 1951 WYNN, R. A. W., 14, Nursery Avenue, Hale, near Altrincham, Cheshire. *ec. ent, hem.*
- 1945 YODEN, GEORGE H., F.R.E.S., 18, Castle Avenue, Dover, Kent. *l.*
- 1950 YOUNG, Miss G. M., 31, Turnpike Lane, London, N.8. *l.*
- 1952 YOUNG, L. D., 55, Ottways Lane, Ashted, Surrey. *ent.*

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Members will greatly oblige by informing the Hon. Secretary of any errors in, additions to, or alterations required in the above addresses and descriptions.

# Geographical List of Members arranged under Country, County and Town in Alphabetical Order

## ENGLAND.

### BEDS.

*Leighton Buzzard.*  
Reid, J. F.

### BERKS.

*Finchampstead.*  
Hyde, R. A.  
*Mortimer.*  
Easton, N. T.  
*Newbury.*  
Saundby, R. H. M. S.  
*Reading.*  
Baker, B. R.  
Dolton, H. L.  
Runge, C.  
Williams, L. H.  
*Sunninghill.*  
Southwood, T. R. E.  
*Wallingford.*  
Newman, D. E.  
*Wantage.*  
Smith, F. W.  
*Windsor.*  
Halstead, D. G. H.  
Wykes, N. G.

### BUCKS.

*Aylesbury.*  
Spittles, C. E.  
*Bletchley.*  
Kershaw, S. H.  
Richardson, N. A.  
*Great Missenden.*  
Stedall, H. P. P.  
*High Wycombe.*  
Oliver, G. B.  
Oliver, G. H. B.  
*Newport Pagnell.*  
Cripps, C. H.

### CAMBS.

*Cambridge.*  
Raven, C. E.  
Rivers, C. F.  
Storey, W. H.  
*Wisbech.*  
Elgood, W. S.

### CHESHIRE.

*Altrincham.*  
Wynn, R. A. W.

*Bebington.*

Prichard, R.  
*Caldy.*  
Clarke, C. A.  
*Chester.*  
Smith, S. G.  
*Nantwich.*  
Boyes, J. D. C.  
*Northwich.*  
Crewdson, R. C. R.  
*Stalybridge.*  
Charlson, S.  
*Wilmslow.*  
Kloet, G. S.

### CUMBERLAND.

*Brampton.*  
Johnson, G. F.  
*Carlisle.*  
Day, F. H.  
*Penrith.*  
Hervey, G. A. K.

### DERBYSHIRE.

*Derby.*  
Atherly, Miss M.  
*Ilkeston.*  
Blasdale, P.

### DEVON.

*Ashburton.*  
Stidston, S. T.  
*Axminster.*  
Bliss, A.  
*Kingsbridge.*  
Wilkinson, C.  
*Plymouth.*  
Watkins, O. G.  
*Newton Abbot.*  
Coleridge, W. L.  
*Sampford Peverell.*  
Lyon, F. H.  
*Torquay.*  
Lees, F. H.  
*Totnes.*  
Atkinson, J. L.

### DORSET.

*Broadmayne.*  
Philpott, V. W.  
*Dorchester.*  
Lisney, A. A.  
*Wimborne.*  
Harwood, P.



## DURHAM.

*Barnard Castle.*

Robson, J. P.

*Gateshead.*

Montgomery, J. R. P.

*Stockton-on-Tees.*

Ward, W. J. V.

*Sunderland.*

Jefferson, T. W.

## ESSEX.

*Brentwood.*

Stanley-Smith, F.

Williams, D. M.

Williams, E. F.

Williams, E. P.

*Colchester.*

Blaxill, A. D.

Firmin, J.

Ives, D. H.

Pearson, A. J. R.

*Harlow.*

Forster, H. W.

*Hornchurch.*

Rawlings, C. J.

*Leigh-on-Sea.*

Watts, W. J.

*Loughton.*

Lockington, N. A.

Payne, R. M.

Sutton, G. R.

*Mistley.*

Rose, I. C.

*Rayleigh.*

More, D.

*Shenfield.*

Friedlein, A. F. E.

*Southminster.*

Dewick, A. J.

*Waltham Abbey.*

Sculthorp, A. H.

*Westcliff-on-Sea.*

Huggins, H. C.

*Woodford Green.*

Smith, D. N. K.

## GLOS.

*Bourton-on-the-Water.*

Renfrew, C.

*Bristol.*

Bell, C. L.

Ellison, E. F. D.

Hinton, H. E.

Watkins, N. A.

*Hardwicke.*

Demuth, R. P.

*Mitchthampton.*

Richardson, A.

*Quedgeley.*

Thorpe, J.

*Stroud.*

Peacey, A. F.

*Telbury.*

Newton, J.

## HANTS.

*Alton.*

May, J. T.

Robinson, H. S.

*Andover.*

Maxwell, R. M.

*Basingstoke.*

Goodliffe, F. D.

*Bishopstoke.*

Ray, H.

*Bordon.*

Schofield, C. H.

Wright, D.

*Bournemouth.*

Brown, S. C. S.

Curtis, W. P.

Fraser, F. C.

Redgrave, A. C. R.

Symes, H.

Turner, H. J.

Whitehead, J.

*Burley.*

Mackworth-Praed, C. W.

*Christchurch.*

Barton, B. C.

Carr, F. M. B.

*Eastleigh.*

Curl, B. J. A.

*Farnborough.*

Parfitt, R. W.

Richards, A. W.

*Fordingbridge.*

Burton, P. J.

*Gosport.*

Burns, B. S.

*Lymington.*

Farwell, I. G.

*Micheldever.*

Dixon, C. H.

*North Warnborough.*

Potter, N. B.

*Portsmouth.*

Langmaid, J. R.

*Romsey.*

Ransome, A. L.

*Rowlands Castle.*

Stanley, F. C.

*Sandy Down.*

Robinson, P. J. M.

*Southampton.*

Watson, R. W.

*Warblington.*

Sperring, A. H.

*Winchester.*

Blyth, S. F. P.  
Ffennell, D. W. H.

**HERTS.***Arkley.*

Howarth, H.  
Howarth, T. G.

*Barnet.*

Calderara, P.  
Vivian, R. S. A.

*Bishop's Stortford.*

Allan, P. B. M.  
Ashwell, D. A.  
Craufurd, C.  
Mellows, C.

*Broxbourne.*

Thorn, B. A.

*Kings Langley.*

Dunk, H. C.

*Redbourn.*

Bowden, S. R.

*St. Albans.*

Byers, F. W.  
Edwards, G. G.  
Wildridge, W.

*Tring.*

Cockayne, E. A.  
Goodson, A. L.

**HUNTS.***Wood Walton.*

Leeds, H. A.

**I. OF MAN.***Santon.*

Hedges, A. V.

**I.O.W.***Cowes, East.*

Saunt, J. W.

**KENT.***Ashford.*

Bushby, L. C.  
Cue, P.  
Duffield, C. A. W.  
Rudland, W. L.  
Scott, E.

*Aylesford.*

Davis, G. A. N.

*Beckenham.*

Lane, A. W.

*Bexley.*

Ford, L. T.  
Newman, L. H.

*Borough Green.*

McDermott, C. A.

*Boxley.*

Frazer, J. F. D.

*Broadstairs.*

Harbottle, A. H. H.

*Bromley.*

Cox, W. A. A.  
Jacobs, S. N. A.

*Canterbury.*

Parry, J. A.

*Dartford.*

Hare, E. J.  
Scudder, G. G. E.  
West, B. K.

*Ditton.*

Llewelyn, J. R.

*Dover.*

Youden, G. H.

*East Malling.*

Massee, A. M.

*Folkestone.*

Morley, A. M.  
Self, K. W.

*Gillingham.*

Wallis, J. L. P.

*Gravesend.*

Whitehorn, K. P.

*Littlebourne.*

Marsh, D. G.

*Maldstone.*

Grant, F. T.

*Meopham.*

Pounce, A. G.

*Orpington.*

Gowing-Scopes, E.  
Line, H. V.  
Siggs, L. W.

*Otford.*

Manley, W. B. L.  
Manley, Mrs. W. B. L.

*Petts Wood.*

Taylor, J. O.

*Ramsgate.*

Lanfear, A. H.

*Sandhurst.*

Bull, G. V.

*Sevenoaks.*

Busbridge, W. E.

*Shortlands.*

Morris, M. G.

*Stidcup.*

Ling, R. B.  
Taylor, H. G. W.

*St. Mary Cray.*

Chatelain, R. G.

*Tatsfield.*

Ellis, J. E.

*Tonbridge.*

Blest, T.

*Westerham.*

Edwards, R. C.

*West Wickham.*  
Chalmers-Hunt, M.  
Owen, G. V.  
*Wilmington.*  
Honeybourne, T. J.

## LANCS.

*Accrington.*  
Thornton, J.  
*Blackburn.*  
Bryce, D.  
*Bolton.*  
Coxey, S.  
*Burnley.*  
Wrightson, A. L.  
*Formby.*  
Davidson, A. R.  
Leech, M. J.  
*Grange-over-Sands.*  
Heath, J.  
*Manchester.*  
Michaelis, H. N.  
Wood, E. F.  
*Nelson.*  
Brindle, A.  
Jopson, F. L.  
*Southport.*  
Greenwood, K. C.

## LEICESTERSHIRE.

*Market Harborough.*  
Buckler, H. A.

## LINCS.

*Grantham.*  
Platts, J. H.  
*Grimsby.*  
Jeffs, G. A. T.  
*Lincoln.*  
James, B. C.  
*Market Rasen.*  
Court, T. H.  
*Scunthorpe.*  
Gooseman, M. P.  
*Skellingthorpe.*  
Small, H. M.

## LONDON.

E.4. *Chtingford.*  
Pinniger, E. B.  
Shaw, R. G.  
Weal, R. D.  
Williams, S. W. C.  
E.7. *Forest Gate.*  
Baxter, L. N.  
Baxter, R. N.  
E.11. *Wanstead.*  
Butterfield, A. W.  
Syms, E. E.

N.1. *Canonbury.*  
Buck, F. D.  
N.3. *Finchley.*  
Griffiths, G. C. D.  
N.6. *Highgate.*  
West, B. B.  
N.8. *Hornsey.*  
Young, G. M.  
N.10. *Muswell Hill.*  
Chevallier, L. H. S.  
N.12. *Finchley.*  
Cross, G. S. E.  
N.15. *S. Tottenham.*  
Brooke, W. M. A.  
N.19. *Upper Holloway.*  
Knight, F.  
N.20. *Whetstone.*  
Lorimer, R. I.  
Lovell, R.  
N.W.1. *Regent's Park.*  
Hemming, A. F.  
N.W.3. *Hampstead.*  
Spencer, K. A.  
N.W.4. *Hendon.*  
Webb, H. E.  
N.W.6. *Hampstead.*  
Hillaby, J. D.  
N.W.7. *Mill Hill.*  
Goater, B.  
Howard, A. P.  
N.W.8. *Regent's Park.*  
Ashby, G. J.  
Leston, D.  
N.W.9. *Kingsbury.*  
Turner, A. D.  
S.E.2. *Abbey Wood.*  
Showler, A. J.  
S.E.3. *Blackheath.*  
Gould, A. W.  
S.E.5. *Ruskin Park.*  
Wakely, S.  
S.E.6. *Catford.*  
LeGros, A. E.  
Warrier, R. E.  
S.E.18. *Plumstead.*  
Green, J. A.  
Hards, C. H.  
Popham, W. J.  
S.E.21. *Dulwich.*  
Edwards, T. G.  
S.E.25. *South Norwood.*  
Cornellius, J. A.  
Lewis, E.  
Nissen, C. L.  
S.W.1. *Westminster.*  
Gordon, D. J.  
Harrison-Gray, M.  
Marsh, J. C. S.  
Matthews, D. P. L.  
Prideaux, A. G.

- S.W.2. *Tulse Hill.*  
Hawgood, D. A.  
Newton, J. L.
- S.W.3. *Chelsea.*  
Cadbury, B.  
Cork, C. H.
- S.W.6. *Fulham.*  
Tams, W. H. T.
- S.W.7. *S. Kensington.*  
Evans, E.  
Richards, O. W.  
Roche, C. G.
- S.W.9. *Stockwell.*  
Harvey, J. G.
- S.W.11. *Battersea.*  
Mansell, G. H.
- S.W.13. *Barnes.*  
Hodgkinson, A.
- S.W.15. *Putney.*  
Swain, H. D.
- S.W.16. *Streatham.*  
Christie, J.  
Christie, L.
- S.W.17. *Tooting.*  
Allen, D. M.
- S.W.18. *Wandsworth.*  
Hall, D. G.  
Michaud, J.
- W.2. *Bayswater.*  
Hornabrook, R. W.
- W.5. *Ealing.*  
Hanson, S. M.
- W.6. *Hammersmith.*  
Uffen, R. W. J.
- W.8. *Kensington.*  
Craske, R. M.
- W.9. *Maida Hill.*  
Peters, W.
- W.14. *W. Kensington.*  
Astbury, C. F.  
Wiffen, R. C. G.
- W.C.1.  
Feilden, G. St. Clair.  
Janson, D. B.

## MIDDLESEX.

- Bedfont.*  
Kindred, A. D.
- Eastcote.*  
Goodban, B. S.
- Enfield.*  
Eagles, T. R.
- Feltham.*  
Classey, E. W.
- Greenford.*  
Allen, P. V. M.
- Harrow.*  
Martin, E. L.  
Riordan, B. D.

- Hayes.*  
Moppett, A. A.
- Hounslow.*  
Gerard, B. McC.
- Isleworth.*  
Bradley, J. D.
- Ptner.*  
Minnion, W. E.  
Saunders, J. M. K.
- Stanmore.*  
Harris, W. H. A.  
McCrae, A. W. R.
- Teddington.*  
Ferguson, L. F.
- Twickenham.*  
Stallwood, B. R.

## NORTHANTS.

- Peterborough.*  
Pooles, S. W. P.
- Roads.*  
Humphrey, S. W.
- Wellingborough.*  
Gent, P. J.  
Payne, J. H.

## NOTTS.

- Burton Joyce.*  
Torlesse, A. D.

## OXFORDSHIRE.

- Oxford.*  
Bailey, K. E. J.  
Ford, E. B.  
Kettlewell, H. B. D.  
Varley, G. C.

## SOMERSET.

- Burnham-on-Sea.*  
Heslop, E. A.  
Heslop, I. R. P.
- Frome.*  
Cruttwell, G. H. W.
- Misterton.*  
Lipscomb, C. G.
- Taunton.*  
Turner, A. H.
- Wells.*  
Valentine, A.
- Weston-super-Mare.*  
Blathwayt, C. S. H.

## STAFFORDSHIRE.

- Wolverhampton.*  
Currie, P. W. E.

## SUFFOLK.

- Ipswich.*  
Beaufoy, S.  
White, E. M. S.

## SURREY.

*Ashtead.*

Brush, H. J.  
May, R. M.  
Young, L. D.

*Banstead.*

Gardner, A. E.  
Gates, M. D. C.  
Last, H. R.  
Perry, K. M. P.  
Rumsey, F.

*Carshalton Beeches.*

Thorpe-Young, D. W.

*Cheam.*

Baker, D. B.  
Struthers, F. M.  
Turner, J. F.

*Churt.*

Baker, J. A.

*Chiddingfold.*

Mere, R. M.

*Chipstead.*

Bolton, E. L.

*Chobham.*

Quarrington, C. A.

*Claygate.*

Perkins, J. F.

*Cobham.*

Purefoy, J. B.

*Coulsdon.*

Denvil, H. G.  
Ferrier, W. J.

*Coulsdon (Old).*

Britten, H.

*Cranleigh.*

Collier, A. E.

*Croydon.*

Jacoby, M. C.

*Dorking.*

Carter, R. A.  
Cole, G. A.  
Haynes, R. F.  
Howard, J. O. T.

*Epsom.*

Vallins, F. T.

*Esher.*

Brett, G. A.  
Craske, J. C. B.  
Ennis, L. H.  
Short, H. G.

*Ewell.*

Tunstall, H. G.

*Ewell (East).*

Lang, R. M.  
Wells, H. O.

*Farnham.*

Moore, B. P.

*Fetcham.*

Hickin, N. E.

*Frensham.*

Gurdon, J. B.

*Godalming.*

Stanners, L. S.  
Williams, H. B.

*Guildford.*

Garland, W. A.  
Holroyd, G. C.

*Hersham.*

Moore, D. R.

*Horsley (East).*

Crow, P. N.

*Kingswood.*

Coxon, G. F.

*Leatherhead.*

Watson, D.

*Leigh.*

Fairclough, R.

*Merton Park.*

Coulson, F. J.

*New Malden.*

Spreadbury, W. H.

*Ottershaw.*

Bretherton, R. F.  
Parsons, R. E. R.

*Pirbright.*

Lawson, H. B.

*Purley.*

Henderson, J. L.  
Walker, D. H.

*Redhill.*

Rait-Smith, W.

*Reigate.*

Ryle, G. B.

*Richmond.*

Phelps, C. C.  
Whicher, L. S.

*Sanderstead.*

Russwurm, A. D. A.  
Stockley, R. E.

*Selsdon.*

Foster, T. B.

*Stoneleigh.*

Hutchings, H. R.

*Sutton.*

Bolingbroke & St. John.  
Danby, G. C.  
Frohawk, M. J.  
Summers, E. J.

*Tadworth.*

Wheeler, A. S.

*Thornton Heath.*

Parmenter, L.

*Wallington.*

Brown, F. C.  
Niblett, M.

*Weybridge.*

Best, A. A.  
Messenger, J. L.

*Wimbledon.*

Dacie, J. V.  
Hawkins, C. N.  
Jarvis, C. McK.  
Riley, N. D.  
Tubbs, M.  
Tubbs, R. S.  
Wakely, L. D.

*Woking.*

Stoughton-Harris, G.  
Trundell, E. E. J.  
Worms, C. G. M. de.

*Worcester Park.*

Hyde-Wyatt, B.  
Richardson, A. E.  
Stafford, A. E.

## SUSSEX.

*Arundel.*

Haggett, G. M.

*Billingshurst.*

Curtis, A. E.

*Bognor Regis.*

Clark, J.  
Jarvis, F. V. L.

*Brighton.*

Banner, J. V.  
Dyson, R. C.

*Buxted.*

Odd, D. A.

*Chichester.*

Boyce, B.

*Chiddingly.*

Humphrey, J. C.

*Eastbourne.*

Ellison, E. F. D.  
Ellison, R. E.  
Marcon, J. N.  
Smith, D. S.  
Wallis-Norton, S. G.

*Ferring-by-Sea.*

Menzies, I. S.

*Hailsham.*

Manley, G. E. L.

*Hastings.*

Homer, T. J. G.

*Horsted Keynes.*

Hoare-Ward, J. W.

*Hove.*

Beard, J. W.

*Littlehampton.*

Jay, E. P.

*Newick.*

Embry, B.

*Plaistow.*

Owers, D. E.

*Pulborough.*

Robertson, G. S.  
Wightman, A. J.

*Ringmer.*

Gully, J. G.

*Wisborough Green.*

McClure, A. M.

*Worthing.*

Edwards F. H.

## WARWICKSHIRE.

*Birmingham.*

Bowater, W.  
Evans, L. J.  
Hammond, H. E.  
Noble, F. A.  
Siviter Smith, P.  
Timms, C.

*Olton.*

Wainwright, C.

*Solihull.*

Allen, D.  
Carlier, S. E. W.  
Price, G. C.

*Stoke Golding.*

Murray, D. P.

*Tysoe.*

Trought, T.

## WESTMORLAND.

*Kendal.*

Birkett, N. L.

## WILTS.

*Ramsbury.*

Fraser, R. A.

*Salisbury.*

Temple, V.

*Tilshead.*

Gilman, H. C. R.

*Trowbridge.*

Weddell, B. W.

*Warminster.*

Jackson, R. A.

## WORCESTERSHIRE.

*Evesham.*

Burton, R. J.

*Redditch.*

Latham, F. H.

## YORKS.

*Doncaster.*

Hyde, G. E.

*Dronfield.*

Fearnehough, T. D.

*Hull.*

Rogers, G. B.

Wade, D.

*Leeds.*

Iles, P.  
Taylor, A. S.

*Rotherham.*  
Wilkinson, W.

*Sheffield.*  
Reid, W.

*Shipley.*  
Hewson, F.  
Kemp, J. K. C.  
*York.*  
Smith, A.

## IRELAND.

CO. DUBLIN.  
*Dublin.*  
Talbot de Malahide.

*Glenageary.*  
Baynes, E. S. A.

## SCOTLAND.

ABERDEENSHIRE.  
*Aberdeen.*  
Morison, G. D.

INVERNESS-SHIRE.  
*Newtonmore.*  
Harper, G. W.  
Harper, M. W.

DUMFRIES-SHIRE.  
*Collin.*  
Balfour-Browne, W. A. F.  
*Dumfries.*  
Cunningham, D.

MIDLOTHIAN.  
*Edinburgh.*  
Dunbar, J. G.  
Macnicol, D. A. B.  
Pelham-Clinton, E. C.

## WALES.

GLAMORGAN.  
*Port Talbot.*  
Morgan, H. D.

## ABROAD.

EUROPE.  
*Austria.*  
Klimesch, J.  
*Czechoslovakia.*  
Polacek, V. B.  
*Denmark.*  
Carolsfeld-Krause, A. G.  
Olsen, E. T.  
*France.*  
Herbulot, C.  
Viette, P. E. L.  
*Italy.*  
Storace, L.  
*Sweden.*  
Torstenius, S.

AFRICA.  
*Cape Province.*  
Taylor, J. S.  
*Kenya.*  
Hollebone, L. H. T.  
Sevastopulo, D. G.  
*Nigeria.*  
MacNulty, B. J.  
Roche, P. J. L.  
*Rhodesia.*  
Daly, D. W.  
*Tanganyika.*  
Dudbridge, B. J.

AMERICA.  
*Argentina.*  
Hayward, K. J.  
*Canada.*  
Belrne, B. P.  
*Connecticut (U.S.A.).*  
Gifford, W. S.  
*New York.*  
Klots, A. B.  
*Washington, D.C. (U.S.A.).*  
Hall, S. S.

ASIA.  
*Hong Kong.*  
Burkhardt, V. R.  
*India.*  
Wakely, L. J. D.  
*Japan.*  
Asahina, S  
*Malaya.*  
Stubbs, G. C.  
Tweedie, M. W. F.

AUSTRALIA.  
*New South Wales.*  
O'Farrell, A. F.  
*Tasmania.*  
Couchman, L. E.

## COUNCIL'S REPORT for 1955-56

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Your Council has great pleasure in announcing the conclusion of another satisfactory year, with the Society comfortably settled in its new quarters at Pepys House. The membership has fallen, but only very slightly, and stood at 499 on the 31st December last. This number is made up of two Honorary, three Special Life, 14 Life, 232 Ordinary and 248 Country Members. The trend towards a larger proportion of Country Members continues. Twenty-three new members were elected, 12 resigned and 12 were struck off for failure to pay their subscriptions.

During the year, five members died. These were Mr. H. W. Andrews, Mr. V. E. August, Mr. W. Mansbridge, Mr. A. G. B. Russell and Mr. S. G. Castle Russell. Mr. Andrews, who had been appointed an Honorary Member as recently as November 1953, bequeathed to the Society his large collection of Diptera, of which the Curator gives details later in this report. Mr. Mansbridge was a Special Life Member and had belonged to the Society for 66 years.

After eleven years of invaluable work as the Society's Editor, Mr. T. R. Eagles has signified his wish to retire from this office. We extend to him our sincere thanks and express our profound appreciation of his loyal service and contributions to the welfare of the Society. We will continue to have the benefit of his long experience in the office of Librarian. Mr. F. D. Buck has consented to fill the vacant office, and we are grateful to him for his offer to accept this difficult task. Our thanks are also due to Mr. H. E. Webb for acting temporarily in the rôle of Lanternist, which he has been forced to abandon owing to ill-health. Mr. L. Christie has been elected to the office. We are also grateful to our new Curator, Mr. A. E. Gardner, for his industry in improving the collections, and in particular for his work on the Andrews Collection of Diptera. Good work has also been done by Mr. S. Wakely in arranging Field Meetings and by Mr. T. G. Howarth in preparing an interesting and varied programme of Indoor Meetings. To these members, and to many others who have, in the past year, assisted in many ways, especially by housing the collections and library since their removal from Burlington House, we extend our grateful thanks.

The most notable event of the year was the finding by the Society of new Headquarters, which enables the library and collections to be accessible again at all meetings. This was due in no small measure to the good offices of Mr. A. W. Gould. Satisfactory arrangements have been made with the Junior Institution of Engineers for the establishment of our Headquarters in Pepys House, 14 Rochester Row, London, S.W.1, the permanent home of the Institution. It is conveniently situated near the junction of Rochester Row, Horseferry Road and Greycoat Place, just behind the Army and Navy Stores in Victoria Street, and is only a few minutes walk from either Victoria or St. James's Park Station, and only two minutes from the bus stop at the



Army and Navy Stores. Bus routes Nos. 10, 11, 24, 29, 39, 46, 70, 76 and 134 serve this stop.

The building is in the Victorian Gothic style. The lecture room is on the main floor, five feet above street level, and is 42 feet by 28 feet and 14 feet 6 inches high. There is a platform at one end, and the room will seat well over a hundred. The acoustic properties of this room are excellent. The projection equipment of the Institution is available for our use, and includes a sound-producing cinema projector, an epidiascope and Ross lantern for  $3\frac{1}{4}$ " by  $3\frac{1}{4}$ " slides, and a Kershaw projector for 2" by 2" slides. Nevertheless, your Council has decided that it would be in the interests of the Society to obtain some equipment of its own, and a start has been made with the purchase of a Pullin 35 mm. projector, which can be used for slides or film strip.

The Society's library and collections are arranged to advantage in a semi-basement room, where all cabinets and bookcases are easily accessible, and conditions are admirable for reading or the examination of specimens. The lighting is extremely good, and there is an ample supply of tables and chairs. The Society is indeed fortunate to have secured such excellent accommodation. Council Meetings are held in the library of the Institution, which may also be used by members wishing to read without interruption. Our relations with the Institution are most cordial, and we look forward to a long and happy sojourn in our present quarters.

The Annual Dinner was again held at the Waldorf Hotel, and the guests were Dr. H. E. Hinton of the Department of Zoology, Bristol University; Dr. T. H. C. Taylor, Deputy Director of the Anti-locust Research Centre, and Major A. Greig, Assistant Secretary of the Geological Society of London, and their ladies. The attendance was less than in recent years, but this in no way detracted from the pleasure of the 78 members, guests and friends who did attend.

The Annual Exhibition, which was held on the following day at the apartments of The Royal Society and the Geological Society of London, was again well supported, 311 members and visitors signing the Attendance Register. The exhibits were of a very high standard in interest and presentation, and the year, having been a good one for migrants, produced many interesting species. The special orders for attention were Coleoptera and Hemiptera, and the coleopterists, in particular, seized the opportunity to arrange a good display. The Zoological Society of London once more brought along some of their more interesting insects, spiders and millipedes, and the Infestation Control Division of the Ministry of Agriculture, Fisheries and Food provided an exhibit of lepidoptera and coleoptera infesting food. The Virus Research Unit of the Agricultural Research Council exhibited photographs, optical micrographs and electron micrographs of Insect Viruses. It was also gratifying to see exhibits by the Tring Museum (Rothschild, Cockayne, Kettlewell Collection), The Colonial Termite Research Unit and the Kent Field Club (Burham Down Survey).

Unusual varieties of lepidoptera were selected by Mr. Howarth and photographed by Mr. Tams for reproduction in the Proceedings. We are once more grateful to these members for their work in this connection.

During the year, the usual number of Ordinary Meetings was held, but after the move to Pepys House in the middle of June a reversion was made to the practice of holding meetings on Thursday, which was the custom before the removal to Burlington House. We are much indebted to the lecturers, who provided a most interesting series of talks, often illustrated by slides or films.

The Field Meeting programme was the longest in the history of the Society, 28 meetings having been arranged. The exceptionally fine summer contributed much to the success of these meetings. Seldom was rain encountered, but the number of members attending did not noticeably increase. A visit was paid to Rothamsted Experimental Station at the invitation of Dr. C. B. Williams, and Cosford Mill, Thursley, was visited at the kind invitation of the owner, Mr. Loarridge. Other trips were made to localities as far afield as Buxted, Ham Street, Faversham and Dungeness. We are most grateful to Mrs Odd, Mrs. Mere, Mrs. Bretherton, Mrs. Loarridge and Dr. C. B. Williams for their hospitality in providing tea when meetings were held in their neighbourhood.

Your Council regrets that the hopes expressed last year that the delay in publishing the Proceedings would be lessened did not materialise. The volume for 1953-54 was not ready until the end of April, 1955, and your Council has well before it the necessity to improve the position. The volume in question contained xl + 161 pp., 15 plates, 7 text figures and 4 appendices.

With great regret, your Council has decided to withdraw support from the scheme to survey entomologically, areas in which the Nature Conservancy are interested. Unfortunately the flagging interest of members did not justify its continuance. All members who wish to pursue further this work of surveying have been asked to deal direct with the Nature Conservancy in future. Thanks are due to Mr. H. D. Swain for acting as a link between the Society and the Conservancy during the past year.

The Curator reports that the notable collection of British Diptera, bequeathed to the Society by the late Mr. H. W. Andrews, contains many rare species. Work has commenced on the task of transferring the collection from sixty store-boxes to a suitable cabinet, in which all the specimens will be retained. The nomenclature being adopted is that of Kloet and Hincks (1945). Mr. Andrews's labels and notes, however, are being preserved. Seven drawers, housing over three thousand specimens, have been arranged, and it is hoped to complete the transfer early in 1956.

Other important additions include specimens of the Geometrid moth, *Xanthorhoe biriviata* Bkh., new to Britain, presented by Mr. W. E.

Minnion, and an imago, a preserved larva and a pupa of the Agrotid moth, *Hydraecia hucherardi* Mabille, also new to Britain, presented by the Curator.

During the past year, other welcome additions to the Society's collections were made by Mr. A. E. Gardner and Dr. J. L. Newton (Orthoptera), Messrs R. Eldon Ellison, A. E. Gardner, H. G. W. Taylor (Lepidoptera), A. E. Gardner, R. M. Mere, F. T. Vallins (Trichoptera), R. M. Mere, F. T. Vallins (Hymenoptera), A. H. Sperring (Diptera), and A. E. Gardner (Odonata). The best thanks of the Society are due to these members. Mr. F. T. Vallins has added many specimens to the collection of Palaearctic Lycaenidae, on which he continues to work. The Assistant Curator, Mr. R. D. Weal, has rendered great help by clearing and preparing the cabinet drawers for the Andrews collection.

Several members have borrowed, for research, specimens from the Society's collections, a facility which is open to all entomologists with reasonable cause for requesting the loan of material. The Curator reports that specimens of Neuroptera and Trichoptera are desired; also that many specimens in the collection of Lepidoptera need replacement by better specimens. The following species of Macrolepidoptera are not represented: *Notodonta torva* (Hb.) (*tritophus* (Esp.)), *Hydrillula palustris* (Hb.), *Oria musculosa* (Hb.), *Leucania loreyi* Dup., *Hadena compta* (Schiff.), *Graptolitha lamda* ( $\lambda$ ) (Fabr.), *Cucullia gnaphalii* (Hb.), *Coenophila subrosea* (Steph.), and *Plusia ni* (Hb.). British or Continental examples of these species will be most welcome.

In the summer of 1955 the library was installed in Pepys House. Before the move the Secretary had noted in each book its place in the appropriate bookcase. Had he not done so the task of getting great piles of books sorted into place would have been even heavier than it was. Luckily he was able to be present to organise the work. The President and the Curator helped, and so the books are once more on the shelves and fully available to members. It is confidently hoped that the Library will be used more than ever, as there is ample space for members to sit in comfort to consult the books.

Progress has been made with the binding of periodicals.

Mr. E. E. Symms presented a beautifully bound copy of Müller and Kautz, *Pieris bryoniae* O. und *Pieris napi* L. This important work is illustrated by coloured plates.

Purchases of books have been rather more than in recent years. The list is as follows:—E. B. Ford, *Moths*; Gates Clarke, *Catalogue of Meyrick's Types of Micro-Lepidoptera in the British Museum*, Vol. I and Vol. II; Hennig, *Die Larvenformen der Dipteren*, Vol. III; Wigglesworth, *Physiology of Insect Metamorphosis*; Lees, *Physiology of Diapause in Arthropods*; Crowson, *The Classification of the Families of British Coleoptera* (a bound copy); Hickin, *Caddis; A Coleopterist's Handbook*, published by the Amateur Entomologist's Society; *The Entomology of Spurn Peninsula*.

The Society has acquired a run of the Zoological Record and is now a subscriber.

Other additions to the Library during 1955 are:—

By gift:—Royal Ent. Soc. Lond., *Transactions and Proceedings* of that society, 1953.

By Purchase or Exchange:—Entomologist; Entomologist's Monthly Magazine; Entomologist's Gazette; Entomologist's Record; Canadian Entomologist; Entomological News; Tydschrift voor Entomologica; Opuscula Entomologica; Zoologiska Bidrag; Mitteilungen; Beitrage Zur Entomologie; Lloydia; Wisconsin Academy of Science, Trans.; Fieldiana, Zoology; Bulletin, Societe Entomologique de Belgique; Essex Naturalist; London Naturalist and Bird Report; Proc. I.O.W. Nat. His. Soc.; Lincolnshire Nat. Union; Norfolk and Norwich Nat. Soc. Trans.; Natural History, New York; Smithsonian Institute Reports.

## TREASURER'S REPORT for 1955.

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A year ago I expressed my gratification on being able to report favourably on the Society's financial affairs for a second consecutive year. To-night, it is even more pleasant to tell you that in 1955 we have not only lived within our income but have added still further to our resources.

### CAPITAL ACCOUNT.

The only movement in this Fund is the expenditure of £22 13s 2d on a filing cabinet and accessories for the Secretary's use. He had been authorised to spend up to £30 for this purpose, but found that a second-hand wardrobe pleased him better, when adapted internally, than the regular article would have done.

### BALANCE-SHEET.

In May last £400 in 4% Consols was added to our list of Investments, which now stand at £1,740 9s 3d at cost. The market value of these on 30th December was £1,459, nearly one hundred pounds more than the Fund represented. In cash at the bank or in hand we had some £359, a little more than the amount owing to our only creditor, the printer.

### INCOME AND EXPENDITURE

Income from subscriptions and investment interest at £653 19s 11d is nearly £34 more than in 1954. On the other hand our expenses increased, but after a grant of £375 to the Publication Fund there was sufficient left to transfer £35 to the Library Fund and still leave a balance of £2 18s 1d to add to the accumulation of Revenue, which now stands at £303 5s 6d.

### PUBLICATION FUND

This Fund is greatly helped by an allocation of £50 by the Royal Society from the Parliamentary Grant in Aid of Scientific Publications. I have also received £15 11s in donations from members, whom I take this opportunity of thanking again. I am also promised the cost of two plates in the "Proceedings", which we hope will appear before very long. Other income from sales of publications, investment interest, etc., with the grant from Revenue, should be enough to cover the cost of the "Proceedings and Transactions" 1954-55, estimated at £453 12s 8d.

Mr. Coulson having retired from the Council, his place as auditor has been taken by Mr. Stanley-Smith, to whom, with Mr. Stoughton-Harris, our thanks are due for their kind services.





## LIBRARY FUND—Year ended 31st December 1955.

[illegible]

**PUBLICATION FUND—Year ended 31st December 1955**

Deficit in Provision for "Proceedings"	1953/54	issue of	
Printing and Posting the "Proceedings and Transactions"	1954/55	... ..	14 18 8
Blocks and Printing the Plates—		£323 15 0	
Coloured ... ..	... ..	66 14 4	
Line and Half-tone ... ..	... ..	63 3 4	
Balance at 31st December 1955	... ..	...	453 12 8
			<hr/> 3 3 5
			<hr/>
Balance at 1st January 1955			£1 18 7
Sales of "Proceedings"			15 18 8
Sales of Store-boxes, etc.			0 10 0
Sales of "A Guide to the Smaller Lepidoptera"			2 6 6
Interest—£300 0s 0d 3½ War Stock (Misses E. F. and L. M. Chapman)			10 10 0
Donations			15 11 0
Grant in Aid from the Royal Society			50 0 0
Grant from Income and Expenditure Account			375 0 0
			<hr/> £471 14 9 <hr/>



**HENRY WILLIAM ANDREWS.**

(1876—1955)

The passing of our old friend, H. W. Andrews, on the 9th April, leaves a gap in the ranks of Dipterists that cannot easily be filled. We shall miss his quiet enthusiasm for the flies, to which he turned when still quite young, also his efforts to interest the younger entomologist in an Order where workers are sorely needed.

Andrews joined The South London in 1907, later serving on the Council, and in 1929 he became our President. In 1953 the Council of the day elected him to Honorary Membership—an honour richly deserved. During his membership he was a constant exhibitor. His Presidential Address, "The Earlier Stages of Diptera", and his papers on "Flies and Disease", "Wing Markings in Diptera", and "Some External Aspects of the Bodies of Diptera", among others, were not only valuable contributions to the Society's activities but notable contributions to entomology.

Though a Fellow of The Royal Entomological Society and a member of The Society for British Entomology he liked the less formal atmosphere of the South London where, until his retirement in 1945 and his subsequent removal to the South Coast, he missed few meetings.

Much of his spare time was devoted to the "Entomologist's Record", assisting the late Mr. H. J. Turner as Treasurer from 1925 onwards. He rendered that journal incalculable service in the difficult period following the decease of Turner, by taking over its production for a short while. Finally he gave up this work at the age of 74 after 29 years of conscientious endeavour for a publication primarily catering for the Lepidopterist. Such was his unselfish nature that he gave so much of his time for this purpose.

On his retirement from employment with a London Stock Exchange firm, Andrews left London for the more congenial entomological environment of Bognor, moving to Salisbury and Fordingbridge before finally settling at Highcliff, Hants.

Unfortunately high blood pressure and the condition of his heart compelled him to have hospital treatment in 1954 and he died in April the following year.

In his lifetime he expressed the wish that his collection should go to The South London. His widow very generously gave this collection to the Society which will constitute a reference collection of the greatest value.

A quiet and helpful nature and an unassuming character will endear the memory of H. W. Andrews to all who knew him.



HENRY WILLIAM ANDREWS



# ABSTRACT OF PROCEEDINGS

## INDOOR MEETINGS.

9th FEBRUARY 1955.

The PRESIDENT in the Chair.

Messrs. H. A. Buckler and A. J. R. Pearson were declared elected members.

### EXHIBIT.

Mr. J. O. T. HOWARD—Three species of Geometrid moths: (1) *Phigalia pilosaria* Schiff. (*pedaria* F.), one with almost white ground colour lightly marked with brown (Aviemore, Inverness-shire, 1937), one uniformly brown (Repton, Derbyshire, 1922) and one typical (Dorking, Surrey, Dec. 19th, 1954). (2) *Colotois pennaria* L., a specimen from Dorking, taken Nov. 1954, with cross-lines close together and touching at one point. (3) Aberrant specimens of *Selenia bilunaria* Esp., reared in June 1952, from a Spring ♀ taken that year near Dorking, in which the wings are shorter and broader than the type. He read the following note on the third species: "About 20% of the brood were of this form, which was more pronounced in the females than in the males. The same form in *Lasiocampa quercus* L. was exhibited at our last Annual Exhibition meeting by Mr. Gordon Smith and was figured and named *brevipennis* by Dr Cockayne in the *Entomologist* for Nov. 1954. In a letter to me, after examining a photograph of these specimens, the Doctor wrote: 'I think these "*brevipennis*" forms probably occur in every species, but are rather local in most and are at a disadvantage with normal specimens. Smart's *elinguaria* all had a "vein" missing near the apex of the wing, exactly the same defect in each . . . . The neuration so far as I can see is normal, but your most extreme ♀ seems to me to have the medium shade and basal (really antemedian) fused and the discoidal spot between this and the postmedian, a well-known recessive, the others with fusion of lines on costa demonstrate another recessive . . . I have never seen the "*brevipennis*" form in *S. bilunaria* in any collection . . .'"

### COMMUNICATION.

Mr. G. L. WILKINS gave a talk, illustrated by the lantern, on "Shells and how they live".

23rd FEBRUARY 1955.

The PRESIDENT in the Chair.

Messrs. T. D. Fearnough and A. J. Wightman, F.R.E.S., were declared elected members.

## EXHIBITS.

Mr. A. E. GARDNER—A male *Sympetrum meridionale* Selys taken by the late H. J. Turner at Dawlish, Devon, in 1901. This is the third record of this dragonfly in Britain. The previous records were of two females taken many years earlier. Drawings of the genitalia of this species and of *S. striolatum* Charp. were shown.

Mr. R. TUBBS—An aberration of *Danaus chrysippus* L. with greatly increased areas of white in the forewings, the white extending from the apical bars along the costa. It was taken near Johannesburg, S. Africa. A typical specimen taken in Kenya was shown for comparison, as also a specimen from Madagascar, where, from the series seen, the area of white seems to be slightly greater than normal in continental Africa.

Mr. S. N. A. JACOBS—Water colour drawings of British Oecophoridae for a plate to illustrate his Presidential Address of 26th Jan.

Mr. R. F. BRETHERTON—An albino female of a species of *Eupithecia* taken at Cumnor, N. Berks., August 1936.

## COMMUNICATIONS.

A member drew attention to the possible danger of the incautious use of carbon tetrachloride.

Mr. D. S. FLETCHER gave an account, illustrated by the lantern, of the Ruwenzori Expedition, 1952.

9th MARCH 1955.

The PRESIDENT in the Chair.

## EXHIBITS.

Mr. A. E. GARDNER—The following species of Trichoptera to illustrate his paper: *Phryganea grandis* L., *P. striata* L., *P. varia* Fabr., *Colpotaulius incisus* (Curt.), *Grammotaulius strigosus* (Curt.), *Glyptotendipes pellucidus* (Retz.), *Limnephilus rhombicus* (L.), *L. flavicornis* (Fabr.), *L. affinis* Curt., *L. luridus* Curt., *L. marmoratus* Curt., *L. sparsus* Curt., *L. lunatus* Curt., *L. xanthodes* McLach., *L. elegans* Curt., *Anabolia nervosa* (Curt.), *Stenophylax vibex* (Curt.), *S. stellatus* (Curt.), *S. permistus* McLach., *Halesus radiatus* (Curt.), *Goera pilosa* (Fabr.), *Silo pallipes* (Fabr.), *Odontocerum albicorne* (Scop.), *Leptocerus aterrimus* Steph., *Mystacides longicornis* (L.), *M. nigra* (L.), *Triaenodes bicolor* (Curt.), *Oecetis ochracea* (Curt.), *Hydropsyche instabilis* (Curt.), *H. angustipennis* (Curt.), *Plectrocnemia conspersa* (Curt.), *Holocentropus picicornis* (Steph.), *Philopotamus montanus* (Don.), and *Agapetus fuscipes* Curt. Also microscopical preparations, drawings to illustrate the life-history and artificial flies tied to represent adult Caddis and pupae.

Dr. B. P. MOORE—A preserved first instar larva of the Carabid beetle, *Cychrus caraboides* L.

THE PRESIDENT—(1) Several examples of new species of the genus *Notoxus* (Col., Anthicidae) from the National Parks of the Belgian Congo. These included examples of a species which may prove to belong to a new genus. Attention was drawn to the brush of very long hairs on the apical ventral segment of the abdomen in both sexes of this species. (2) Drawings of the beetles shown which included both the whole insect and anatomical details (mainly aedeagus).

#### COMMUNICATIONS.

A member reported that a wood pigeon was sitting on eggs. Another member had seen starling's eggs early in February. Bullfinches and sparrows had been very destructive of fruit buds, crocuses, etc.

Mr. A. E. GARDNER read a paper, illustrated by the lantern, on Trichoptera.

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23rd MARCH 1955.

The PRESIDENT in the Chair.

#### EXHIBITS.

THE PRESIDENT—Coleoptera from Liberia taken by Dr. Wallace Peters, (1) *Chrysolagria cuprina* Thoms. (Lagriidae), (2) *Chrysolagria* ? spp. (Lagriidae), (3) *Gonocephalum simplex* F. (Tenebrionidae) and (4) *Pseudagrilus sophoras* F. (Buprestidae)

BARON DE WORMS—(1) *Eumenis semele* L., a series taken in the Burren, Co. Clare, Ireland, in August 1954, showing the very bright colour and markings, particularly on the underside, of both sexes. The ground colour of the underside is for the most part pale dove-grey; (2) *Maniola jurtina* L., sub-species *iernes* Graves, a series of both sexes of this Irish race. The males are especially striking with large orange patches on the uppersides of the forewings, while the females have for the most part a greater degree of orange than in the normal English form.

Dr. B. P. MOORE—A pair of the large Myrmeleonid (Neuroptera) *Palpares libelluloides* L. from the south of France.

Mr. F. T. VALLINS—A series of 4 *Nymphalis xanthomelas* Esp. from Yugoslavia with a similar series of *N. polychloros* L. from England for comparison.

Mr. R. W. J. UFFEN—Two teratological red tulip flowers each with a partly green petal inserted below the rest, one with an anther replaced by a narrow petal and the other with a filament incorporated in a petal. He also mentioned a yellow tulip found to have buds and leaves in the axils of the main stem leaves.

13th APRIL 1955.

The PRESIDENT in the Chair.

EXHIBITS.

Mr. K. A. SPENCER—Three species of British Diptera (Agromyzidae) new to Science.

Mr. R. ELTON ELLISON—A collection of about 20 species of rare British Lepidoptera taken at Eastbourne in the last few years.

Dr. B. P. MOORE—A drawing instrument for lettering and technical drawing, known as Pelican Graphos and manufactured in Germany.

COMMUNICATIONS.

It was reported that the following immigrant Lepidoptera had already been noted: *Laphygma exigua* Hb., *Plusia gamma* L. and *Nomophila noctuella* Schiff.

Mr. C. P. ROSE showed a colour film "To Norway in search of Crane".

27th APRIL 1955.

The PRESIDENT in the Chair.

The death of Mr. H. W. Andrews was announced.

EXHIBITS.

Mr. S. WAKELY—(a) Specimens of the genus *Oporinia* bred by one of our members, Mr. J. P. Robson, Co. Durham. They included 12 *O. autumnata* Borkh., 6 *O. dilutata* Schiff. (var. *latifasciata* Prout) and 4 unnamed varieties of this species which occurred in the same strain, together with 10 *O. christyi* Prout showing dark and light forms. Larvae of the latter were also shown feeding on hawthorn. (b) A box of 142 *Acleris* (*Peronea*) *hastiana* L. bred by Mr. L. T. Ford last autumn from larvae taken in Glamorgan, South Wales. The series included several specimens of the striking variety *albimacula*, together with a number of other named and unnamed forms. A couple of specimens of an allied species from Germany, namely *A. scabrana* Hb., were also exhibited. The data labels showed that these were obtained from *Salix viminalis* (L.) (Osier) and it was suggested that this species might be found to occur in this country.

Miss C. A. McDERMOTT—Larvae of *Coenonympha tullia* Muell. bred from ova laid on 4th August 1954, and one larva of *Erebia aethiops* Esp. from an ovum laid on 9th September 1954.

Mr. C. N. HAWKINS—Coleoptera taken at the Effingham (Barns Thorns Wood) Field Meeting, 23rd April 1955:—*Cyrtotriplax* (*Tritoma*) *bipustulata* F., *Gauropterus fulgidus* F. and *Quedius nigriceps* Kr.

Mr. J. L. HENDERSON—*Pilemostoma fastuosa* Schall. taken by Mr. F. M. Struthers at the Box Hill Field Meeting, 17th April 1955.

Mr. A. E. GARDNER—A bred specimen of the cockroach *Blaberus giganteus* L.

## COMMUNICATIONS.

BARON DE WORMS gave an account of Lepidoptera observed this season and other members added their notes.

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11th MAY 1955.

The PRESIDENT in the Chair.

Mr. D. G. H. Halstead was declared elected a member.

## EXHIBITS.

Mr. A. H. SPERRING—An aberration of *Deuteronomos fuscantaria* Steph. with the antemedian and postmedian lines meeting on the inner margin. He read the following note: "In the *Ent. mon. Mag.*, 84: 265, Dr. Cockayne described and illustrated an aberrant form of *Ennomos autumnaria* Wernb. which he named *triangularis*. The distinctive feature of this is that the antemedian and postmedian lines on the forewings are united just before reaching the inner margin. I examined all my specimens, also those of allied species, in the hope that I might have similar forms, but the only one approaching it is this specimen of *D. fuscantaria*, in which the lines meet at the inner margin. The width of the band formed by these lines varies considerably. During past years I have bred considerable numbers of *D. fuscantaria*, *D. alniaria* L. and *Crocallis elinguaris* L. in the hope of similar aberrations, but without success. I conclude, therefore, that the form is rare".

BARON DE WORMS—Larvae of *Trichiura crataegi* L. from Ham Street, Kent, and of *Cerastis rubricosa* Schiff. These were reared from the egg.

Mr. C. N. HAWKINS—A yellow bloom of the garden pansy and a pale blue one found growing on the same plant. This plant was grown from a cutting taken from a plant which showed the same peculiarity.

## COMMUNICATIONS.

Members reported that the season was still very backward. No *Argynnis euphrosyne* L. were flying, no *Pieris napi* L. and only a few *Euchloë cardamines* L. The last were all males. About ten *Lycaena phlaeas* L. had been seen.

Mr. R. G. H. SWEENEY showed a colour film "Some smaller animals of the Sudan".

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25th MAY 1955.

The PRESIDENT in the Chair.

Messrs. M. D. C. Gates and J. B. Gurdon were declared elected members.

## EXHIBITS.

Mr. A. E. GARDNER—A live male dragonfly, *Leucorrhinia dubia* Van der Lind, from a new and flourishing colony in Surrey, taken 24th May 1955.



Mr. R. W. J. UFFEN—(1) A specimen of the moth *Eucosma pygmaeana* Hb. taken at Effingham, Surrey, 23rd April 1955; (2) Both sexes of the fly *Tipula rufina* Meig. from Chiswick, Middlesex.

#### COMMUNICATION.

Dr. H. E. HINTON read a paper, illustrated by the lantern, "The Adaptation of some British Tipulid Pupae to their Environment".

8th JUNE 1955.

The PRESIDENT in the Chair.

The death of Mr. S. G. Castle Russell was announced.

#### EXHIBITS.

THE PRESIDENT—Coleoptera taken at the field meeting at Chiddingfold, Surrey, on 22nd May 1955—(1) *Achenium depressum* Grav.; (2) *Orsodacne lineola* Panz.; (3) *Rhynchites cupreus* L.

Mr. J. L. HENDERSON—The water beetle *Graphoderus cinereus* L., a short series of both sexes taken at Woolmer Bog, Hants, 23rd April 1955.

Mr. A. E. GARDNER—Full-fed larvae of the rare dragonfly *Ischnura pumilio* Charp. bred from eggs obtained from a female taken 19th July 1954 by Mr. J. Cowley in the New Forest, Hants.

Mr. A. W. GOULD—The beetles *Helodes marginata* F. and *Mordella aculeata* L. swept at Shorne Woods, Kent, in the early evening of 5th June 1955.

Mr. F. T. VALLINS—Larvae of *Lycacides idas calliopis* Obth. in fourth instar, bred from ova collected at L'Argentière, Hautes-Alpes, in July 1954, and feeding on *Hippophae rhamnoides* L. (Sea Buckthorn).

Mr. T. R. EAGLES—The fungus *Tricholoma gambosum* Fr., "St. George's Mushroom", from Enfield, Middlesex.

Dr. C. A. CLARKE read a paper on "Experimental Breeding of Butterflies (see Trans., p. 92).

23rd JUNE 1955.

The PRESIDENT in the Chair.

#### EXHIBITS.

THE PRESIDENT—Tenebrionidae from Yirol, Southern Sudan; (1) *Lypros mozambicus* Péring, taken from the nest of a Hammerkop (11.ii.54, E. M. Reid), a Tenebrionid with a very close resemblance to the Lagriidae; (2) *Ceropria* spp. also taken from the nest of a Hammerkop (11.ii.54, E. M. Reid); though this species is quite distinct from *C. romandi* Cast. it could be conspecific with either *C. anthracina* Qued., *C. gabonica* Pic or *C. parumpunctata* Pic, none of which is represented in the Brit. Mus. (Nat. Hist.); and (3) *Alphitobius diaperinus* Panz. taken from the nest of a Kite; this beetle is

cosmopolitan and is of course represented in the British fauna. No previous record can be found from bird's nests though the habitat of this species is rather varied including old flour, in cut grass and hedge clippings, on bole of beech, in waste grain from a horse's manger, under sacks and logs on a rubbish dump, in vegetable refuse, in and on sacks of ground nuts and on sacks in a bone-boiling works.

Mr. M. G. MORRIS—Larvae of *Euphyia luctuata* Schiff. from ova laid by a female moth taken at the Field Meeting at Ham Street, Kent, 28th May 1955, and feeding on Rosebay Willow-herb (*Chamaenerion angustifolium* (L.) Scop.).

Mr. T. R. EAGLES—(1) The fly *Scenopinus fenestralis* L. from Enfield, Middlesex; (2) A graft hybrid or Chimaera of Hawthorn and Medlar also from Enfield; (3) Tufts of the reddish orange threads of the mycelium of the fungus *Coprinus radians* (Desm.) Fr. found growing on logs at Effingham, Surrey, 23rd April 1955. This was formerly regarded as a distinct entity and called *Ozonium auricomum*. See Ramsbottom, 1953, *Mushrooms and Toadstools*, pp. 84 and 129, and the coloured figure in Wakefield and Dennis, 1950, *Common British Fungi*, Plate LXXXII, fig. 4A.

#### COMMUNICATIONS.

Mr. HAWKINS referred to the enquiry he had made at the previous meeting about a case of plant behaviour. He has in his garden at Wimbledon a patch of *Iris pseudacorus* L. As each flower stem reaches a height of 18 inches to 2 feet it bends over at about a right angle half way up the stem so that the upper portion bearing the developing buds is roughly parallel with the ground. The stem becomes erect again either by straightening itself or by making a second right angled bend. The same thing was noted in a garden at Chobham, Surrey, on 18th June 1955, where the Field Meeting party were taking tea. He supplied a detailed note.

Members reported that owing to the lateness of the season Spring moths such as *Orthosia incerta* Hufn., *O. stabilis* Schiff. and *O. gothica* L. were appearing in June. Similarly *Lycia hirtaria* Clerck had been noted on 12th May.

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14th JULY 1955.

The PRESIDENT in the Chair.

Canon C. E. Raven, D.D., D.Sc., F.B.A., F.L.S., and Messrs. R. S. A. Vivian and C. Wilkinson were declared elected members

#### EXHIBITS.

THE PRESIDENT—Examples of coleoptera from Monks Wood, Hunts, 19.vi.55. (1) *Agathidium laevigatum* Er. (2) *Melasis buprestoides* (L.). (3) *Molorchus umbellatarum* (Schr.). (4) *Mordellistena abdominalis* (F).

Mr. J. L. HENDERSON—The beetles *Rhisophilus imperialis* Germ. and *Gyrinus suffriani* Scrib. from Leigh Pond, Cuckfield, Sussex, 9th July

1955. All had fungi attached (*Laboulbenia* sp.), in numbers on the ground beetle, and one or more on all the water beetles, mostly attached to the elytral margins.

Mr. J. R. LANGMAID—Melanic specimens of *Leucania unipuncta* Haw. and *Agrotis exclamationis* L. and an example of *Ennomos autumnaria* Wern., all from Southsea, Hants.

Mr. A. E. GARDNER—Hymenoptera:—Two live larvae of the Birch Sawfly *Cimbex femorata* L. taken at Wisley, Surrey, 29th June 1955. Lepidoptera:—A preserved larva, pupa and imagines of *Parascotia fuliginaria* L. bred from larvae found at Wisley, 18th April 1955. Dermaptera:—Specimens of *Anisolabis annulipes* Lucas taken by Dr. B. P. Moore at Quillan, Aude, S. France, June 1955. Orthoptera:—*Acrotylus insubricus* Scop., *Pyrgomorpha conica* Oliv. and *Anacridium aegyptium* L. taken by Dr. B. P. Moore, Port Lanouvelles, S. France, June 1955. Odonata:—A live male *Ischnura pumilio* Charp. bred; *Aeshna isosceles* Muell. a pair taken at Hickling Broad, Norfolk, 9th July 1955. Coleoptera:—*Nebria livida* L., *Crypticus quisquilius* L. and *Chrysolina sanguinolenta* L. from Sheringham, Norfolk, 10th July 1955.

Mr. R. W. J. UFFEN—A specimen of *Cucullia absinthii* L., bred from a larva found at Chiswick, London, W.4, on *Artemisia vulgaris* L. (Compositae), September 1954.

Mr. C. N. HAWKINS—A flower-bearing stem from the plant of *Iris pseudacorus* L. referred to at the previous meeting.

Mr. F. T. VALLINS—Three live imagines (2 ♂♂ and a ♀) of *Lycaeides idas* race *calliopis* Boisduv. bred from specimens captured in July 1954, at L'Argentière la Bessée (Hautes Alpes) France.

Mr. A. W. GOULD—The following Coleoptera:—*Judolia cerambyciformis* Schr. taken at Tillingbourne, Surrey, 2nd July 1955 by Miss C. McDermott and *Falagria thoracica* Curtis, *Amara strenua* Zimm. and *Pseudostyphlus pilumnus* Gyll. taken at Faversham, Kent, 26th June 1955. The last named was beaten from chamomile.

Mr. T. R. EAGLES—(1) Second instar larvae of *Apatele aceris* L. bred from ova obtained at Enfield, Middlesex. (2) A nearly spherical ball of vegetable matter, 2 inches in diameter, one of some hundreds found on a beach at Majorca. It was determined at the British Museum (Natural History) to be an aggregation of fibres from the decayed leaf bases of the plant *Posidonia caulini* C. Koenig (Fam. Naiadaceae) growing in the sea along the shores of the Mediterranean.

#### COMMUNICATIONS.

BARON DE WORMS reported that *Cucullia absinthii* L. was spreading rapidly. A few years ago it was common at Birmingham. Since then it had been found at Chesterfield, London, Suffolk and North Kent.

A member reported seeing a swarm of Corixid bugs on the wing on 1st April 1955.

Several members reported that the season was still very late as evidenced by the moths coming to mercury-vapour traps. As an instance *Cucullia chamomillae* Schiff. had been taken on 1st July.

28th JULY 1955.

The PRESIDENT in the Chair.

Professor Alexander B. Klots and Mr. R. W. Hornabrook, Ch.B., M.R.A.C.P., were declared elected members.

#### EXHIBITS.

Mr. R. ELDON ELLISON—Melanic forms of *Biston betularia* L. including ab. *carbonaria* Jord., ab. *insularia* Th.-Mg. and intermediates.

Mr. A. E. GARDNER—The following Coleoptera:—*Trinophylum cribratum* Bates taken by Mr. E. W. Classey in a timber yard at Feltham, Middlesex, 24th July 1955; *Aulonium trisulcum* Geoff. and *Trox scaber* L. taken at mercury vapour light, Feltham, 25th July. Orthoptera:—A pair of *Chorthippus vagans* Eversmann from Sopley Common, Hants., 24th July. Odonata:—A pair of *Cordulegaster boltoni* Den., same place and date. Diptera:—*Tabanus bovinus* L., *T. sudeticus* Zell., f. *confusus* Goffe and f. *verralli* Oldroyd from the collection of the late H. W. Andrews presented to the Society.

Mr. G. C. D. GRIFFITHS—(1) Mines and adult of the Trypetid *Spilographa spinifrons* Schroeder taken at Westerham, Kent, 9th September 1954. An adult ♂ emerged 1st May 1955. This little-known species was found in great abundance mining the leaves of *Solidago virgaurea* L. (Compositae). The enormous lower fronto-orbital bristles of the adults, especially males, are very characteristic. (2) Empty mines of an unknown species of *Agromyza* in leaves of *Verbena officinalis* L. (Verbenaceae), Box Hill, Surrey, 24th July 1955. These mines cannot be attributed to the larval stage of any known species.

#### COMMUNICATIONS.

Mr. F. HILL, B.Sc., gave a talk, illustrated by the lantern, on "The Natural History of the Atomic Weapon Ranges in Australia".

11th AUGUST 1955.

Lt.-Col. W. B. L. MANLEY, Vice-President, in the Chair.  
Mr. P. Iles was declared elected a member.

#### EXHIBITS.

Mr. J. O. T. HOWARD—First instar larvae of *Celerio galii* Schiff., the offspring of a female taken in a light trap at Dorking, Surrey, on the night of 29th July. They were being fed on Rosebay Willow-herb, *Chamaenerion angustifolium* (L.) Scop. (Onograceae).

Mr. M. NIBLETT—Diptera bred from fungus:—Tipulidae, *Ula sylvatica* Meig. Mycetophilidae, *Mycetophila fungorum* Deg. Muscidae, *Pegohylemyia cinerea* Fln., *Pegomyia winthemi* Meig., *Fannia canicularis* L., *F. difficilis* Stein, *Muscina assimilis* Fln. and *Mydaea discimana* Mall.

Messrs. W. E. MINNION and B. S. GOODBAN—(1) *Xanthorhoë biriviata* Borkh., taken in Southern England, including the Summer form *aestiva* Fuchs and a living larva. The species, which occurs in East and Central Europe, including Denmark and Holland, does not appear to have been recorded previously from the British Isles. It was first found flying freely in sunlight and again at dusk. It is associated with *Impatiens* on which the larva feeds. (2) A series of *Gonodontis bidentata* Clerck bred from a ♂ *ab. nigra* Prout from Yorkshire and a typical ♀ from Chesham, Bucks. *Nigra* is a dominant and the ♂ must have been heterozygous as the brood resulted in approximately one half of each form. In addition, examples with scaleless areas referable to *abs. fenestrata* Ckne. and *nigro-fenestrata* Ckne. appeared together with a form which is not represented in the collection at Tring. This has the black body and fringes of *nigra*, the whole of the wings being buff and free from markings. These aberrations showed marked crippling and weakness and refused to pair. (See *Ent. Record*, 58: 94.)

Mr. H. G. TAYLOR—*Maniola jurtina* L., a very small aberration with no underside markings, from Sidcup, Kent.

Mr. S. WAKELY—(1) The lily beetle, *Lilioceris lili* Scop., and (2) Ova of the Tortricid moth *Eulia formosana* Hb., both from Byfleet, Surrey.

Dr. J. NEWTON—Specimens of the cockroach *Ectobius panzeri* Steph. found in Marram Grass at Poole, Dorset, in July 1955, including male adults, nymphs and ootheca.

Mr. A. E. GARDNER—Diptera: *Volucella zonaria* Poda, Feltham, Middx., 1.viii.55. Coleoptera: *Agonum sexpunctatum* L. from Chobham Common, Surrey, 5.viii.55, *Strangalia quadrifasciata* L., Weybridge, Surrey, 1.vii.55. and *Phymatodes testaceus* L. Feltham, Middx., 24.vii.55. Lepidoptera: Two preserved larvae of *Hydraecia hucherardi* Mab. dug from the roots of the Marsh Mallow, *Althaea officinalis* L., in Sussex, 7.viii.55. Flowering stems of the *Althaea* were also exhibited and the method of finding the larvae discussed.

Mr. Gardner presented one of the preserved larvae to the Society.

Dr. B. P. MOORE—A larva of a Silphid beetle, probably *Silpha tristis* Ill., from Frensham, Surrey.

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25th AUGUST 1955.

The PRESIDENT in the Chair.

#### EXHIBITS.

THE PRESIDENT—A series of *Oteniopus sulphureus* L. (Col.) taken on the cliff-top off umbelliferae, between Sheringham and West Runton, E. Norfolk, 8.viii.55.

Mr. T. R. EAGLES for Mr. R. D. WEAL—Coleoptera taken in North Devon during June 1955: *Panagaeus crux-major* L., Braunton; *P. bipustulatus* F., Woolacombe; *Euchlora dubia* Scop. var. *aenea* Deg., Woolacombe; *Corymbites bipustulatus* L., Umberleigh;

*Ceuthorhynchidius horridus* Panz. and *Trachodes hispidus* L., Umberleigh.

Dr. B. P. MOORE—Recent captures of Coleoptera including *Orchesia undulata* Kraetz., *Salpingus reyi* Ab. and *Rhynchites cupreus* L.

Mr. J. L. HENDERSON—The beetle *Chrysolina menthastri* Suff. taken on *Mentha aquatica* L., at the Field Meeting at Cosford Mill, Thursley, Surrey, 21st August 1955.

Mr. R. M. PAYNE—*Decticus verrucivorus* L. (Orth.) taken recently in E. Sussex.

Mr. F. T. VALLINS—(1) Pupae of the butterfly *Lycaeides idas* race *calliopis* Boisduv. found at L'Argentière (Hautes Alpes, France). Pupation takes place on the female plants of the food-plant, Sea Buckthorn, among the berries, which the pupae closely resemble in shape and colour; (2) Living immature specimen of a Mantis from Grenoble; (3) A living male of the spider *Eresus cinnaberinus* Oliv. taken at Briançon (Hautes Alpes, France).

#### COMMUNICATIONS.

Mr. ROBIN MERE made a short report on an expedition made by him and another South London member, Mr. E. C. Pelham-Clinton, in mid July to the 4,000 foot high plateau at the top of Braeriach in the Cairngorms. A mercury vapour lamp and generator were carried to this height and used as was sugar. After giving a short description of the terrain and flora a list of lepidoptera taken in the course of day and night work was given, namely:—3 *Apamea assimilis* Doub. males, 2 light, 1 sugar; 1 *Eumichtis adusta* Esp. male, light; 1 *Crambus furcatellus* Zett. male, by day; 1 *Argyroploce schulziana* Fabr., by day; 2 *Gelechia similis* Staint. females, by day; 1 *Argyresthia conjugella* Zell. male, by day; 1 *Elachista* not yet identified, at dusk; 1 *Aglais urticae* L. was seen by day. Some grass was picked and placed in a tin for the purpose of subsequent identification. One *Colostygia didymata* L. female was bred from this. Whether it had been feeding on the grass, or not, is unknown. The results of much hard work were considered rather disappointing.

Members reported that this year a fair number of *Colias croceus* Fourc. had been seen and a few *C. hyale* L. In many parts of Southern England *Celerio galii* Schiff. had come to light or appeared as larvae. *Palpita unionalis* Hb. had been taken in a light trap in Sussex on several nights.

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15th SEPTEMBER 1955.

The PRESIDENT in the Chair.

#### EXHIBITS.

Mr. J. O. T. HOWARD—A. ♀ *Celerio galii* Rott., taken in a light trap at Dorking, Surrey, on 29th July 1955, and another specimen bred from one of her eggs, which emerged on 13th September.

Mr. R. E. ELLISON—*Arctia caja* L., an aberration with reduced dark markings on forewings, and no black basal spots on hindwings. Taken at Eastbourne, Sussex, in July 1955.

Mr. T. J. HONEYBOURNE—(1) A melanic example of *Apatele leporina* L. from Dartford, Kent; (2) The Saturniid moth *Loepa katinka* Westw., a specimen bred from a wild pupa, in which the eye-spot on the left forewing was much enlarged and misshapen.

Mr. A. W. GOULD—Coleoptera: (1) *Cossonus linearis* F. taken from dead poplar at Ufford, Suffolk, 7th September 1952; (2) *C. parallelepipedus* Herbst., specimens taken from rotten elm, Windsor Park, 4th October 1944 (ex coll. A. A. Allen), and dead specimens from rotten poplar at Weston Turville, Bucks., 12th September 1955.

Mr. ROBIN MERE—A larva of *Palpita unionalis* Hb. feeding on Jasmine.

Mr. A. E. GARDNER—Orthoptera: A live ♀ *Stetophyma grossum* L. taken on Catcott Heath, Somerset, by Mr. J. Cowley. Dermaptera: A series of *Apterygida albipennis* Charp. taken at Lydden, Kent, 25th August. Odonata: A series of ♂ *Sympetrum flaveolum* L. taken on Wimbledon Common, Surrey, 6th September. Lepidoptera: A pair of *Hydraecia hucherardi* Mabille, bred from larvae taken in E. Sussex, August 1955.

Mr. W. H. SPREADBURY—A complete cast skin of a grass snake.

#### COMMUNICATIONS.

Mr. ALFRED G. LEUTSCHER gave a talk, illustrated by the lantern and by specimens, on "Reptiles in Britain".

29th SEPTEMBER 1955.

The PRESIDENT in the Chair.

Mr. M. C. Jacoby was declared elected a member.

#### EXHIBITS.

BARON DE WORMS—Larvae of the following moths:—(1) *Eurois occulta* L. from Aviemore, Inverness-shire; (2) *Xanthorhoë quadri-fasciata* Clerck from Surrey; (3) *Eupithecia millefoliata* Roessl. from Romney Marsh, Kent; (4) *Cosymbia orbicularia* Hb. from the New Forest, Hants.; (5) *Thalera fimbrialis* Scop. from Dungeness, Kent.

Mr. J. O. T. HOWARD—A series of *Coenonympha tullia* Muell. from Borth, Cardiganshire, probably the southern limit of the butterfly's range in Britain.

Mr. H. G. W. TAYLOR—*Panaxia dominula* L. ab. *bimacula* Ckne.

Dr. B. P. MOORE—Two adult *Megatoma undata* L. (Col., Dermestidae), in their larval exuviae, which had been bred from larvae taken at the Ockham Field Meeting in April.

Mr. R. TUBBS—Pupae and imagines of Tachinid species parasitic on *Pieris napi* L.



Mr. T. R. EAGLES for Mr. T. J. HONEYBOURNE—A teratological leaf of dock.

Mr. T. R. EAGLES—A samara of *Acer pseudoplatanus* L. with an extra carpel, cf. W. C. Worsdell, 1916, *The Principles of Plant-Teratology*, Vol. II, 93.

#### COMMUNICATIONS.

*Rhodometra sacraria* L. had been noted on 5th September at Braunton Burrows, Devon, and larvae of *Macroglossum stellatarum* L. were abundant there feeding on *Galium verum* L. *Nycterosia obstipata* F. was taken in a light trap at Dorking, Surrey, on 24th September. *Lithosia quadra* L. had been taken recently at Chiddingfold, Surrey. At Dungeness, Kent, there had been swarms of imagines of *Phlogophora meticulosa* L.

13th OCTOBER 1955.

The PRESIDENT in the Chair.

The death of Mr. W. Mansbridge was announced.

#### EXHIBITS.

Mr. and Mrs. T. G. HOWARTH—(1) Specimens of the Dipteron *Thaumatomyia notata* Meig. from a swarm at Arkley, Herts., and (2) Larvae of *Heliothis peltigera* Schiff. from Shoreham by Sea, Sussex.

Mr. J. O. T. HOWARD—(1) A varied series of *Hadena conspersa* Schiff. bred from larvae collected on *Silene maritima* With. at Mullion Cove, Cornwall. (2) Dark aberrations of the following Lepidoptera taken at light at Dorking, Surrey:—*Apatele rumicis* L., *A. aceris* L., *Apocheima hispidaria* Schiff., *Deuteronomos alniaria* L. and *Biston betularia* L.

Mr. J. R. LANGMAID—*Cryphia divisa* Esp. (*raptricula* Hb.) taken at Southsea, Hants., 18th August 1955.

Mr. B. K. WEST—Specimens of the Sphingid moths *Ambulyx carteri* Rthschld. and *Protoparce afflicta* Grote taken on New Providence Island, Bahamas, in February 1946.

Mr. A. E. GARDNER—Live specimens from the Camargue, South France, 15th-25th September 1955:—Dermaptera, *Labidura riparia* Pallas; Orthoptera, *Mantis religiosa* L., *Gryllotalpa gryllotalpa* L. and *Acrida mediterranea* Dirsh.; Arachnida, *Euscorpius* sp.

Mr. R. M. MERE—A nearly full fed larva of *Mythimna turca* L. bred from an egg laid by a female from Whitehill, Hants.

#### COMMUNICATIONS.

Mr. R. E. ELLISON had at the beginning of the month noted *Rhodometra sacraria* L. in abundance in the Isle of Wight.

Mr. J. D. BRADLEY showed slides and a colour film of "The Solomon Islands Expedition".



29th OCTOBER 1955.

## THE ANNUAL EXHIBITION—RECORD OF EXHIBITS

Mr. K. E. J. BAILEY—(1) *Pararge aegeria* L. ab. *egerides* Stdgr., a typical ♀ and a very pale ♂ gen. 1, N. Berks., May 1955. (2) *Eumenis semele* L., 2 ♂♂ and 2 ♀♀ s.sp. *thyone* Thomp., Gt. Ormes Head, 15.vii.55, and a melanic ♀ without the hindwing apical spot, Woodbury Common, S. Devon, 31.vii.54. (3) *Maniola tithonus* L., a series of 5 ♂♂ and 4 ♀♀ from S. Devon, showing *excessa* Leeds and *antiexcessa* Leeds forms, July 1954. A ♀ underside ab. resembling *lanceolata* Shipp of *Aphantopus hyperantus* L., Honiton, S. Devon, August 1954. (4) *M. jurtina* L., 3 ♀♀ with very pale forewing fulvous patch, Harwell, Berks., 15.viii.54; ♀ with posterior two-thirds of right forewing fulvous patch replaced by white, Oxon., 16.viii.54; ♀ ab. *anticrassipuncta* Leeds, N. Berks., 13.vi.54; ♀ ab. *antiexcessa* Leeds, Honiton, S. Devon, 14.viii.55; ♀ ab. *minor* Leeds, Chilterns, 23.viii.55; ♂ ab. *pupillatanulla* Leeds, Birmingham University, 19.vii.55. (5) *Coenonympha pamphilus* L., 2 ♂♂ bleached, Wilts., 1955; ♀ underside ab. *antiexcessa* Leeds, Farnborough, Berks., 13.viii.55. (6) *C. tullia* Müll. s.sp. *philoxenus* Esp., 2 ♂♂ and 3 ♀♀ from a series taken at Whixall Moss, N. Shropshire, 10.vii.55; also ♂ and ♀ ab. *cockaynei* Hopkins. (7) *Aphantopus hyperantus* L. ♂ and *M. jurtina* L. ♀ taken in cop., Baggington, Wars., 23.vii.55. (8) *A. hyperantus* L. ab. *arete* Müll., 4 ♂♂ from a good series taken in Worcs. and Oxon., July 1955; 2 ♂♂ and 3 ♀♀ of intermediate form from a good series also taken in Worcs. and Oxon., July 1955; ♀ underside ab. with left forewing bleached and a pale buff partial suffusion on left hindwing, N. Berks., 12.vii.54; ♀ underside teratological form with right hindwing spots forming a band. (9) *Argynnis selene* Schiff., ♂ with median forewing spots very faint; ♂ with submarginal hindwing spots joined to outer chevrons; 2 ♀♀ melanic with median forewing spots enlarged and suffused with black; all from Wilts., June 1955. (10) *A. paphia* L., ♀ heavily marked, with white spots on forewing sub-apical area, Ashclyst Forest, S. Devon, 11.viii.54. (11) *A. urticae* L., ♂ and 5 ♀♀ with ground colour variations including ♀ with left hindwing ground colour replaced by white, and a similar ♀ with posterior half of right forewing affected; ♀ approaching ab. *ichnusa* Bonelli; ♀ ab. *polaris* Stdgr.: all from Oxon. and S. Devon, August 1955. (12) *Nymphalis io* L., ♀ with the normal central area colour of each forewing replaced by buff, Rockbeare, S. Devon, August 1954. (13) *Apatura iris* L., ♂ and ♀ from a series bred from Oxfordshire ova, emerged July 1954. (14) *Plebejus argus* L., 3 ♀♀ s.sp. *caernensis* Thompson, Gt. Ormes Head, 15.vii.55. (15) *Polyommatus icarus* Rott., 2 ♂♂ ab. *minor* Ckll., Oxon. and Glos., August 1955; a fine ♂ ab. *ultraradiata* B. & L., Bucks., 21.viii.55; ♂ ab. *anti-dex-transformis* B. & L., W. Ilshly, Berks., August 1951; ♀ ab. *post-dex-obsolata* B. & L., Berks., 19.vii.54; also a ♀ ab. *radiata* Tutt, captured by D. E. Newman, Oxon., August 1955. (16) *Lysandra coridon* Poda, a number

of named aberrations, all taken in the S. Midlands during the seasons 1954/5. (17) *Maculinea arion* L., a typical ♀, a ♀ ab. with the forewing upperside spots wedge-shaped and generally melanic; a very small ♀ ab. from N. Cornwall, July 1953. (18) *Lycaena phlaeas* L., ♂ abs. *auroradiata* B. & L., Honiton, S. Devon, 15.viii.55, and *partimauroradiata* B. & L., N. Berks., 21.viii.55. (19) *Colias hyale* L., a fine ♂, Clyst St. Lawrence, S. Devon, 15.viii.55. (20) *C. croceus* Fourc., ♀ ab. with left upperside discoidal spot lanceolate, S. Devon, August 1954, ♀ ab. *helice* Hb. with the basal area of the forewings melanic, Oxon., 4.viii.55. (21) *Carterocephalus palaemon* Pall., ♂ and ♀ taken Northants, 18.vii.55. (22) An example of the freshwater fish *Abramis brama* L. (the common Bream) which was captured and preserved by the exhibitor.

Dr. J. V. BANNER—The following lepidoptera:—*Orthosia gracilis* Schiff., a series bred from larvae taken in Dorset; *Jodia croceago* Schiff., a series bred from a female taken near Chiddingfold, Surrey; *Lygephila cracca* Schiff., a series bred from larvae taken in Cornwall; *Ennomos quercinaria* Hufn., F2 generation bred from female taken at mercury vapour light in exhibitor's garden at Brighton; *Arctia caja* L., an aberration taken at mercury vapour light at Pevensy; *Lysandra coridon* Poda, aberrations from Sussex; *Argynnis euphrosyne* L., an aberration taken in Sussex.

Mr. CECIL L. BELL—(1) *Pyrgus malvae* L. ab. *taras* Bergstr., an extreme aberration taken in Sussex during 1955. (2) *Gonepteryx rhamni* L., a gynandrous specimen taken in Hants. during 1955. Right hindwing displaying female scaling, the remaining wings being male. (3) *Vanessa atalanta* L., specimen with straw coloured bands on hindwings, from Bristol in 1955, and a specimen with unusually dark red markings also from Bristol; (4) *Lysandra bellargus* Rott., an extreme pale blue colour variety, which has an unusually dark underside, taken in Wilts., 1955 (2nd. brood).

Mr. C. S. H. BLATHWAYT—Some migrant moths taken at Weston-super-Mare during 1955 by the exhibitor:—*Celerio galii* Schiff. Four specimens taken in July. *C. livornica* Esp. One specimen taken in August. *Eurois occulta* L. One specimen taken in August. *Oria musculosa* Hb. One specimen taken in July. *Heliothis peltigera* Schiff. One specimen taken in June and three specimens taken in August. *Palpita unionalis* Hb. Four specimens taken in June, August and September.

Mr. A. D. BLAXILL—(1) *Aglais urticae* L., 5 specimens showing a gradation of variation leading to an extreme example of ab. *polaris* Stdgr. Taken in the Colchester district 1954 and 1955. (2) *Erebia aethiops* Esp. Six specimens of either sex, showing variations, particularly one dark underside female with extreme silver banding on underwings. Taken in late July and early August in 1954 and 1955; Argyll, Perthshire and Ross-shire.

Mr. & Mrs. E. L. BOLTON—*Aphantopus hyperantus* L. ab. *goodsoni* Pilleau, taken in Surrey, July 1955; also a female of the same species

having the diameter of the hindwing markings of curious formation, much reduced in size, July 1954. *Pararge aegeria* L., a pathological specimen taken in Surrey, 1952. *Pieris napi* L., female albino caught wild in Dorset, July 1955.

Mr. R. F. BRETHERTON—The following Lepidoptera:—(1) *Apatura ilia* Schiff., a series of 14 males, taken in Forêt d'Armainvillers, Seine-et-Marne, France, 2.vii.55, showing gradation from the typical to f. *elytie* Schiff. (2) Scarce immigrants taken at mercury vapour light, Ottershaw, Surrey; *Itame brunneata* Thunb. (*fulvaria* Vill.), male, 11.vii.55; *Dioryctria splendidella* H.S., male, 23.vii.55; *Palpita unionalis* Hb., male, 19.viii.55. (3) Aberrations: *Plebejus argus* L., a female (or possibly an intersex) with upperside almost wholly blue, underside of normal female colour; Chobham Common, 10.viii.55; *Dicycla oo* L., ab. *renago* Haw., Lucas Green, Surrey, 11.vii.55; *Pheosia gnoma* Fab., an extreme melanic, probably of ab. *fernandi* Redt. (hitherto only recorded from Lapland), Ottershaw, at mercury vapour light, 21.viii.55 (Plate III. fig. 9). (4) Bred series: *Hadena barrettii* Doubl., emerged 21.vi./2.vii.55 from larvae found in roots of Rock Spurry at Tintagel, Cornwall, 2.ix.54; *Calophasia lunula* Hufn., from Dungeness larvae found 2.vii.54, two females emerged 13.viii.54, and four males and three females 14.vi./12.vii.55. (5) *Apatele alni* L., Balcombe (Sussex), 21.vii.55; *Harpyia bicuspis* Borkh., Balcombe (Sussex), 21st June; *Craniophora ligustri* Schiff., Chiddingfold (Surrey), 29th July; *Cucullia absinthii* L., bred from larva, Boscastle (Cornwall), emerged 24th July; *Eupithecia jasionata* Crewe, bred from larva in *Jasione montana* L., Tintagel (Cornwall), emerged 2nd July; *Hydraecia hucherardi* Mab., Romney Marsh (Kent), 23rd September; *Odontotia carmelita* Esp., Ottershaw and Ockham (Surrey), 28th and 30th April; *Apamea oblonga* Haw., West Wittering (Sussex), 15th July; *Selenia lunaria* Schiff., Ottershaw at light, 6th and 15th June; *Leucania favicolor* Barr., West Wittering, 15th July; *Angerona prunaria* L., Chiddingfold, 26th June; *Amathes ditrapezium* Schiff., Netley Heath (Surrey), 24th July.

Mr. G. A. BRETT, on behalf of the Ministry of Agriculture, Fisheries and Food—An exhibit of insects introduced into this country on imported foodstuffs. Twenty commonly introduced beetles and five commonly introduced moths, and also six of the more interesting, but rarely introduced, insects were shown.

The species exhibited, with notes, are as follows:—

During 1953, 160 species of insects and 27 species of mites were recorded on infestable commodities. The most commonly introduced beetle is *Tribolium castaneum* (Herbst) and the most commonly introduced moth is *Ephestia cautella* (Walk.). Both of these species are ubiquitous and are recorded from all types of stored food commodities.

The following list gives details of some of the more commonly introduced insects:—

(1) On Grain, Wheat, Barley, Maize, etc. COLEOPTERA—*Sitophilus oryzae* (L.), *Rhizopertha dominica* (Fab.), *Oryzaephilus surinamensis*

(L.), *Laemophloeus ferrugineus* (Steph.), *L. minutus* (Oliv.), *Tribolium confusum* J. du V., *Ahasverus advena* (Waltl), *Tenebroides mauritanicus* (L.), *Trogoderma granaria* Everts, *Palorus* spp. LEPIDOPTERA—*Corcyra cephalonica* (Staint.), *Plodia interpunctella* Hb., *Sitotroga cerealella* Oliv.

(2) On Cereal Products; Flour, Pollards, Bran, Germ, etc. COLEOPTERA—*O. surinamensis*, *T. confusum*, *A. advena*, *T. mauritanicus*. LEPIDOPTERA—*Ephestia elutella* Hb., *E. kuhniella* Zell., *C. cephalonica*, *P. interpunctella*.

(3) On Oilseeds, cakes and meals; Palm kernels, Linseed cake, Groundnuts, Groundnut cake, Cotton seed, Copra, etc. COLEOPTERA—*Necrobis rufipes* (Deg.), *O. surinamensis*, *T. confusum*, *T. mauritanicus*, *Carpophilus dimidiatus* (Fab.), *Dermestes ater* Deg., *D. frischii* Kug., *D. maculatus* Deg., *T. granaria*, *Palorus* spp. LEPIDOPTERA—*E. elutella*, *C. cephalonica*.

(4) On Cocoa beans. COLEOPTERA—*N. rufipes*, *T. mauritanicus*, *D. ater*. LEPIDOPTERA—*E. elutella*.

(5) On Dried Fruit; Currants, Raisins, Sultanas, Dried Figs, etc. COLEOPTERA—*O. surinamensis*, *L. ferrugineus*, *C. dimidiatus*, *C. hemipterus* (L.). LEPIDOPTERA—*E. elutella*, *C. cephalonica*, *P. interpunctella*.

(6) On Animal products; Bones, Hooves, Horns, Hides, etc. COLEOPTERA—*N. rufipes*, *D. ater*, *D. frischii*, *D. maculatus*.

The following are less common but still regularly introduced beetles:—*Oryzaephilus mercator* (Fauv.) mainly on dried fruit, *Sitophilus granarius* (L.) and *Laemophloeus turcicus* Grouv. mainly on grain.

Some interesting, though rare, introductions are given below:—

*Ptinus tectus* Boield. This beetle, now rarely introduced, was originally brought from Australia and New Zealand, chiefly on cereal products and has become firmly established in this country.

*Tribolium destructor* Uyttenb. This beetle has become established in one or two localities in this country during the last few years, although it is very infrequently recorded on ship's cargoes, chiefly on cereal products.

*Tribolium anaphe* Hinton. This species has only recently been recorded in very small numbers from ship's cargoes of cereal products. It may well have been misidentified as *T. confusum* J. du V. in the past.

*Ephestia calidella* (Guen.). This moth was for a long time confused with *E. elutella* Hb. and *E. cautella* Walk. It has since been recognised as distinct and is occasionally recorded, mainly on locust beans from the Mediterranean region.

*Ephestia figulilella* Greg. During the last two years this moth has been recorded in small numbers from the Mediterranean region and from Australia, mainly on dried fruit.

*Mussidia nigrivenella* Rag. This moth has only occasionally been introduced. It is normally a pest on stored maize in tropical Africa,

but in 1953 was recorded from Nigerian butterbeans, which had probably acquired the infestation whilst in storage in West Africa.

Mr. FREDERICK C. BROWN—Some moths bred from larvae collected on bomb sites in the City of London during 1954:—*Deilephila elpenor* L., *Cerura vinula* L., *Spilosoma lutea* Hufn., *S. lubricipeda* L., *Phalera bucephala* L., *Melanchra persicariae* L., *Ceramica pisi* L., *Callimorpha jacobaeae* L., *Arctia caja* L. (including a number of aberrations), *Smerinthus ocellatus* L., *Laotoë populi* L. "All these species were common on the bomb sites in 1954, and specimens were collected over the whole area of the City. The larvae of *Arctia caja* L. were observed in the autumn of 1954 but were not taken until May 1955, in order that they might hibernate successfully before collection. Larvae of *Deilephila elpenor* L. which were extremely plentiful in 1954 appeared to be lacking in 1955, possibly owing to the very dry summer which caused the food plants—*Epilobium* spp.—to dry up completely before attaining any great size. Contrary to popular belief, very few indeed of these larvae were parasitised, the exceptions being a few specimens of *Smerinthus ocellatus* L. and *Laotoë populi* L."

Mr. F. D. BUCK—A box of the more interesting Coleoptera taken at Monks Wood, Hunts., during the Nature Conservancy Survey.

Mr. B. S. BURNS—Lepidoptera bred and captured during 1955:—(1) *Aphantopus hyperantus* L., 1 ♂ and 1 ♀ ab. *arete* Müll., captured 20th July in S.E. Hants. (2) *Euphydryas aurinia* Rott. A ♂ aberration showing surplus and suffused black markings and loss of most of the red coloration. The black dots of the normal central row on the hindwings practically, if not totally, absent. Taken in S.E. Hants. on 5th June. (3) *Aglaia urticae* L. Three aberrations captured during August and September, near Fareham, Hants. The two small central spots on two of these insects are abnormally small, and in one instance the wings are somewhat pale. The hindwings of the third aberration are exceptionally pale. (4) *Nymphalis io* L. A female aberration caught in nature near Fareham on the 20th of August. The ocelli are obliterated on both forewings with absence of coloration, including the yellow spot between the two black markings on the costa. The normal smoky-pearl band which partly encircles the large black and metallic blue ocellus on each hindwing, is abnormally dull, being darkish grey in colour. (5) *Gastropacha quercifolia* L. 2 ♂♂ and 2 ♀♀ forming part of a second brood bred from a female specimen caught near Bishopstoke, Hants., on 11th July. About 166 ova were laid which hatched about 14 days later. The larval stage lasted about four weeks and the cocoon hatchings covered a period of 39 days—although the cocoon period for each moth was about 14 days.

Mr. P. J. BURTON—(1) *Argynnis aglaia* L., a straw coloured ♂ from the Cheltenham district. (2) *Abraxas grossulariata* L., an ab. with pale cream ground, and only the orange band and black central spot on the forewings showing. Taken by G. J. Baker, Roydon (Plate II, fig. 7). (3) The following from Hampshire: *Argynnis selene* (Schiff.) a second brood series (bred), *Lymantria monacha* (L.), dark banded

forms, *Panaxia dominula* (L.), specimens without a basal spot (bred), *Celerio livornica* (Esp.), *Zeuzera pyrina* (L.), *Apatele alni* (L.), *Euphyia picata* (Hb.), a bred series, *Cepphis advenaria* (Hb.), a bred series, *Atolmis rubricollis* (L.), a short bred series, *Anchoscelis litura* (L.), an ab. with row of spots on outer border of the forewings, *Orthosia stabilis* (Schiff.), specimen with banded forewings, *Leucania impura* (Hb.) left forewing dwarfed, *Palpita unionalis* (Hb.).

Mr. L. C. BUSHBY on behalf of The Zoological Society of London—(1) Arachnida:—Fat-tailed Scorpion, *Androctonus australis* (L.); Desert Scorpion, *Buthus occitanus* (Amor.); Imperial Scorpion, *Pandinus imperator* C. L. Koch; Bird Eating Spiders, *Eurypelma californica* Ausserer and *Grammostola* sp.; Palm Spider, *Scodra griseipes* Poc.; Young of *Avicularia avicularia* (L.); Whip Scorpion, *Thelyphonus caudatus* (L.). (2) Crustacea:—Land Hermit Crabs, *Cenobita* spp. (3) Phasmida:—Javan Stick Insect, *Orxines macklotii* (Haan); Corsican Stick Insect, *Clonopsis gallica* (Charp.); Devon Stick Insect, *Acanthoxyla prasina* (West.). (4) Dictyoptera:—Young Mantids, Mantidae. (5) Saltatoria:—Foaming Grasshopper, *Dictyophorus spumans* (Thun.), Young of Long Headed Grasshoppers, *Acrida turrita* L. (6) Diplopoda:—Millepedes, various spp.

Mr. S. E. W. CARLIER—(1) Longhorn beetles from the west Midlands: *Tetropium gabrieli* Weise, bred from larch by H. R. Munro, Lickey Hills, near Birmingham, also var. *crawshayi* Sharp; *Asemun striatum* L., in pine log, Barford-on-Avon, Warwicks.; *Cerambyx scopoli* Fuessly, one, in beech timber, in Birmingham furniture-maker's yard (probably German); *Rhagium bifasciatum* Fab., occurring in most woods in the area, often in oak, also the abs. *nigrolineatum* Don., Lickey Hills and Earlswood, Warwicks., *ornatum* Fab., Earlswood, and *ictericum* Schl., Wyre Forest; *R. mordax* Deg., not so generally distributed as the previous species, but present in both Warwicks. and Worcs.; *Stenocorus meridianus* L., generally distributed and common, also abs. *cantharinus* Hbst. and *chrysogaster* Schrank.; *Acmaeops collaris* L., not uncommon some years in Wyre Forest, Salop/Worcs.; *Grammoptera ruficornis* Fab., everywhere; *Alosterna tabacicola* Deg., everywhere; *Leptura livida* Fab., on Geranium, Harvington, Worcs.; *Strangalia melanura* L., on flowers, common in Wyre Forest and on Gloucester Cotswolds; *S. nigra* L., not uncommon in Wyre Forest; *S. maculata* Poda, everywhere, commonest abs. are *separata* Kauf., *disconota* Pic., *undulata* Muls. and *apicalis* Kauf.; infrequent abs. are *impunctata* Muls., Wyre Forest, *externepunctata* Muls., Wyre Forest, *mediopunctata* Kauf., Wyre Forest, *binotata* Muls., Edgbaston (Birmingham), Bubbenhall (Warwicks.) and Wyre, *manca* Schauf., Wyre Forest, *suturalis* Kauf., Wyre Forest, and *dayremi* Pic. (almost *bifenestrata* Pic.), Wyre Forest; *S. quadrifasciata* L., not uncommon in Wyre Forest, also at Randan Wood, Bromsgrove, Worcs., in small numbers, also a var. with first black band consisting of 3 separate spots and another with only the humeral and sutural spots present in the first band; *Judolia cerambyciformis* Schrank., not uncommon in



Wyre Forest and abundant in meadows by river Severn between Bewdley and Arley, also varieties with sutural spots missing and with spots enlarged almost forming a complete fascia; *Molorchus minor* L., in spruce, Lickey Hills, and Coleshill, Warwicks., not scarce. *M. umbellatarum* Schreb., rare, on *Umbelliferae*, Wyre Forest, and on *Spiraea*, Painswick, Gloucs.; *Aromia moschata* L., taken by H. E. Hammond and K. G. V. Smith at Earlswood, Warwicks. *Callidium violaceum* L., a pair in cop. on flowers in garden, Wilmcote, Warwicks.; *Phymatodes testaceus* L., on sugar on elm at night, Barford-on-Avon, Warwicks., also bred from oak logs by H. R. Munro, all black except elytra which are testaceous, Lickey Hills; *Clytus arietis* L., everywhere but not abundant; *Anaglyptus mysticus* L., occasional in both Warwicks. and Worcs., appearing some years but not others; *Acanthocinus aedilis* L., odd ones and twos in various parts of Birmingham (probably imported in timber); *Pogonochaerus hispidulus* P. & M., on hawthorn and crab-apple blossom, Earlswood, Wilmcote, Warwicks., etc.; *P. hispidus* L., sweeping hedgerows in spring, Painswick, Gloucs. and Stanton Lacey, Salop; *Leiopus nebulosus* L., not uncommon, Wyre Forest and Malvern, Worcs.; *Saperda populnea* L., in suitable woods in Warwicks. and Worcs., usually not uncommon where it occurs; *Tetrops praeusta* L., Umberslade, Solihull, and Wooton Wawen, Warwicks., probably generally distributed.

(2) Some melanic and other darkened forms of Lepidoptera from the industrial west Midlands; *Notodonta dromedarius* L., a black (? local) form: *Tethea duplaris* L. ab. *obscura* Tutt., only form in Birmingham area; *Sarrothripus revayana* Scop., about 75% black, no really pale forms; *Apatele megacephala* Schiff., dark and normal forms about equal; *A. leporina* L., ab. *bradyporina* Tr. only; *A. rumicis* L., ab. *salicis* Curt., as common as typical form, most specimens are intermediate; *Agrotis segetum* Schiff. and *A. puta* Hb., both these *Agrotis* show tendency to be dark; *Polia nebulosa* Hufn., Birmingham normals shades darker than New Forest specimens, ? ab. *bimaculosa* Esp. and a dark form near ab. *robsoni* Collins; *Discestra trifolii* Hufn., dark form only in Birmingham area; *Dryobotodes protea* Schiff., black forms commoner than green in some woods in area; *Bombycia viminalis* Fab., no pale forms in Birmingham area; *Procus strigilis* Clerck, all Birmingham specimens dark (black with grey sub-marginal band); *P. latruncula* Schiff., all black or nearly so; *Apamea secalis* L., vary variable, but darker forms commoner in Birmingham area; *A. monoglypha* Hufn., dark forms frequent, though not predominant, probably quite a small percentage; *Allophyes oxyacanthae* L., about two-thirds of Birmingham specimens appear to be ab. *capucina* Mill.; *Orthosia incerta* Hufn., pale forms extremely scarce—red-black and grey-black forms being commonest, deep red-brown and deep black not uncommon; *Sterrhia seriata* Schrank, shows a tendency to be dark; *Cosymbia albipunctata* Hufn. (*pendularia* Clerck auctt. nec Clerck), Cannock and Black Country (Kinver) specimens have darkened ground with a rosy central patch; *Trichopteryx carpinata* Borkh., typical specimens commonest, but

produces a brownish suffused form ? ab. *obscurata* Schneid. and more frequently a form with heavy (broad) central bar, other lines suppressed ? ab. *unifasciata* Rbl.; *Thera obeliscata* Hb., most Birmingham area and Cannock specimens are rather dark and some almost black; *Hydriomena furcata* Thunb., very variable, but most of the green forms are heavily marked, with dark and grey-black forms frequent; *H. coerulata* Fab., variable, has a black form in Birmingham area; *Eupithecia absinthiata* Clerck, from some 30 feral larvae (Birmingham, Marston Green area) I bred one black specimen (? ab. nov.), about a dozen all somewhat dark brown, the rest were parasitized by three different kinds of Hymenoptera (i.e., 60% parasitized); *E. lariciata* Freyer, a black ab. occurs at Sutton Park, Warwicks. and at Kinver, Staffs., intermediates also occur at Kinver: *Ellopiia fasciaria* L., 24 larvae (feral) from Cannock Chase produced 11 red (typical) and 10 grey ? ab. *grisearia* Fuchs., (3 died) = 50% grey; *Semiothisa liturata* Clerck, about 30 feral larvae from Cannock Chase produced slightly over 75% (black) ab. *nigrofulvata* Collins, at Sutton Park, Warwicks., *nigrofulvata* is scarce, certainly not more than 10%; *Erannis marginaria* Fab., variable in area, dark ♀♀ much commoner than dark ♂♂; *E. leucophaearia* Schiff., typical form commonest but ab. *marmorinaria* Esp. very frequent, a completely suffused form ? ab. *merularia* Weym. is definitely scarce—nearly black ♀♀ occur; *Selenia bilunaria* Esp., very dark infuscated specimens occur in the Stourbridge area, less markedly infuscate forms occur occasionally in the Birmingham area; *Gonodontis bidentata* Clerck, usual forms in the Birmingham area tend to be dark brownish-grey, the black form though scarce in the Birmingham area is common at Cannock Chase: *Phigalia pilosaria* Schiff. (*pedaria* Fab.), the blackish suffused ab. *monocharia* Staud. is fairly frequent in the Birmingham area, so are nearly black ♀♀; *Biston betularia* L., the typical form seems to be absent from some parts of the Birmingham area all specimens being ab. *carbonaria* Jord., in other parts both the typical form and ab. *carbonaria* occur, and occasionally ab. *insularia* Th. Meig.

Rev. F. M. B. CARR—*Arctia caja* L. ab., forewings very heavily marked with brown and the hindwings with black, Mudeford, Hants, at light; *Abraxas grossulariata* L., ab. with outer marginal spots of forewings extending inwards as dashes, Mudeford, at light; *Plusia gamma* L., some very minute specimens, Mudeford, at light; *Hydraecia paludis* Tutt., a series selected from a very large number taken at Sandbanks, Dorset and Mudeford, Hants, at light—ground colour pale brown, olive, deep brown and various shades of red, and the spot from white to orange, being in some cases almost obsolete; *Rhodometra sacraria* L., single specimen taken at light this year at Mudeford; *Nycterosia obstipata* Fab., a short series taken at light this year at Mudeford; *Eulia formosana* Geyer, two taken at light this year at Mudeford; *Palpita unionalis* Hb., Bournemouth, at light; *Eupithecia* sp.? taken at rest, Taunton, Somerset, 1955.

Mr. E. W. CLASSEY—See A. E. GARDNER.

Mr. F. W. COCKS—See H. L. DOLTON.



Mr. G. A. COLE—A short series of *Coenonympha tullia* Müll. from Borth, Cardiganshire, July 1955, and Co. Armagh, N. Ireland, June 1941; an ab. of *Melitaea cinxia* L. bred from Isle of Wight larvae collected in April 1955; an example of *Pararge megera* L. with cream ground colour taken at Dorking, 20.viii.55; 4 *Harpyia bicuspis* Bork. bred from ova laid by a female taken at mercury vapour light in Tilgate Forest, 5.vi.54; a short series of *Anepia irregularis* Hufn. and *Lithostege griseata* Schiff. from the Breck Sand area; an asymmetrical variety of *Aspitates ochrearia* Rossi caught at Deal, 22.viii.55 (Plate II, fig. 3); and a series of *Rhometra sacraria* L. bred from a pair taken at Braunton Burrows, N. Devon, 5.ix.55. These show considerable colour variation. The pupae were kept in an underground shelter where the temperature varied from 40° F. at night to 60° F. by day, and were only removed to a temperature of about 75° F. immediately prior to emergence.

Major A. E. COLLIER—Varieties of Rhopalocera: *Argynnis euphrosyne* L., halved gynandromorph, Sussex, 23.v.55; *Aphantopus hyperantus* L. ab. *lanceolata* Shipp, examples from a homozygous mating, *lanceolata* ♂ × *lanceolata* ♀; *Euphydryas aurinia* Rott., aberrations, some extreme, caught or bred in Surrey, 1955; *Lysandra coridon* Poda, aberrations taken in Wiltshire, 1955; *Gonepteryx rhamni* L. ab. *filia* Röber, Cranleigh, September 1955, captured and recognised as an aberration by Christopher Nixon, aged 8.

Mr. F. J. COULSON—See H. D. SWAIN.

Mr. S. COXEY—(1) from the Burren of Co. Clare, Ireland. A selection from 129 species taken or observed from 6th to 12th August, inclusive. *Ammogrotis lucerneae* L., *Thalporhiza matura* Hufn., brighter than the English form, *Calamia tridens* Hufn. (*virens* L.), *Amathes castanea* Esp., *Triphaena janthina* Schiff., bright pinkish forewings, *Lygris testata* L., purplish forms predominated, *Cidaria fulvata* Forst., *Colostygia salicata* Hb., *Ortholitha chenopodiata* L., a very variable species, *Epirrhoë tristata* L., very abundant, *Perizoma albulata* Schiff., *P. minorata* Treits., *Aspitates gilvaria* Schiff. s.sp. *burrenensis* Cockn., *Gnophos myrtillata* Thunb., *Selidosema brunnearia* Vill. (*plumaria* Schiff. Brit. Auct.), *Abraxas grossulariata* L. from an isolated colony in which the dark markings of the forewings tend to unite centrally. (2) from Portmadoc, *Cleora cinctaria* Schiff., a bred series. (3) from Bolton, *Apamea scolopacina* Esp, *Plemyria rubiginata* Schiff. (*bicolorata* Hufn.), *Amathes glareosa* Esp., ab. *rosea* Tutt and others. (4) from Grange, *Hepialus fusconebulosa* Deg. with female examples of ab. *gallicus* Led., *Habrosyne pyritoides* Hufn. (*derasa* L.), *Apatele leporina* L., *Plusia bractea* Schiff., *P. iota* L., *Cidaria fulvata* Forst., *Perizoma taeniata* Steph., *Hydriomena furcata* Thunb., a bred series (sallow). (5) from Studland, *Macroglossum stellatarum* L., *Peridroma porphyrea* Schiff., *Tholera popularis* Fab., a row of females, *Aporophyla nigra* Haw., *Leucania vitellina* Hb., *Mysticoptera sexalata* Ratz. (*sexalisata* Hb.) (bred), *Epirrhoë alternata* Müll. a bred example with all the markings curiously blurred.

(6) from Portland, *Aporophyla australis* Boisd., *Leucochlaena hispidula* Gey. (7) from Sychnant Pass, *Amathes ashworthii* Doubl., a series at mercury vapour light, and *Agrotis trux* Hb. (8) from Grassington, *Phothedes captiuncula* Treits., *Perizoma minorata* Treits., *Entephria caesiata* Schiff, *Stilbia anomala* Haw. (9) from Delamere, *Apocheima hispidaria* Schiff., a short series. (10) from Sussex, *Iodis lactearia* L. (bred), *Euphyia luctuata* Schiff. (bred), *Archiearis notha* Hb. (bred), Tilgate. (11) from Windermere, *Eustroma reticulata* Schiff., a short series. (12) from Burnt Wood, *Bena fagana* Fab. (*prasinana* Auct. nec L.).

Mr. G. A. N. DAVIS—(1) The following Lepidoptera taken or bred at Aylesford, Kent: 2 *Apatele rumicis* L. ab. *salicis* Curt., *Antitype flavicincta* Schiff., *Hydraecia paludis* Tutt, *Apamea secalis* L. ab. *leucostigma* Esp., 2 *Nonagria sparganii* Esp., both very heavily marked with black, 3 *Nonagria geminipuncta* Haw. of the sooty-brown ab. *nigricans* Stdgr. (bred from larvae), *Plusia festucae* L., *Herse convolvuli* L., *Tathorhynchus exsiccata* Led. (taken in 1951) believed to be the first record for Kent, 2 *Cosmia trapezina* L. ab. *ochrea* Tutt and ab. *badiofasciata* Teich., *Eilema griseola* Hb., 2 *Lobophora halterata* Hufn. ab. *zonata* Thunb., 2 *Hydrelia testaceata* Don. ab. *goodwini* Banks, *Orthosia munda* Schiff. var. *immaculata* Stdgr., *Biston strataria* Hufn., a very dark black and brown form, *Lycia hirtaria* Clerck with wings of a uniform pale grey without markings, *Alcis repandata* L. ab. *conversaria* Hb. (2) Other lepidoptera: 2 *Hydraecia hucherardi* Mab. taken near Rye, Sussex, 2 *Hadena albimacula* Borkh. from Dungeness, Kent, *Antitype xanthomista* Hb. taken at sugar in N. Cornwall, 2 *Dryobotodes protea* Schiff., one pale green, the other marked strongly with white, bred from larvae taken at Glendaruel, Argyllshire, 2 *Dasychira fascelina* L. bred from larvae found on broom at Dungeness, a large pale aberration of *Hada nana* Hufn. taken in July 1954 on a cliff top at Tintagel, Cornwall, 3 *Eilema pygmaeola* Doubl. from Dungeness, 2 *Aplasta ononaria* Fuessl. from Folkestone, Kent, 2 *Entephria caesiata* Schiff., abs. *glaciata* Germar and *nigristriaria* Gregson from Glendaruel, Argyllshire, 2 grey-brown specimens of *Ellopiopsis fasciaria* L., 2 *Cepphis advenaria* Hb. from Cranleigh, Surrey.

Mr. C. H. DIXON—(1) *Celerio galii* Schiff., 18.viii.55, Micheldever, Hants; *Alcis repandata* L. ab. *conversaria* Hb., New Forest, 10.vii.55; *Panaxia dominula* L., a melanic specimen bred from wild larva, Hants., 29.iv.55 (Plate III, fig. 2); *Hydraecia hucherardi* Mab., Romney Marsh, Kent, 14/16.ix.55; *Apamea infesta* Ochs. (*anceps* Hb.), a reddish specimen from Micheldever, 26.vi.55; *A. epomidion* Haw. (*hepatica* Hb.), a dark specimen, Micheldever, 7.vii.55; *Selenia bilunaria* Esp., a dark specimen, Micheldever, 26.iv.55; *Eustroma reticulata* Schiff., Westmorland, 28.vii.55; *Lygephila craccae* Schiff., bred ex larvae, Cornwall, 13.vi.55; *Hadena conspersa* Schiff., bred ex larvae, Unst., 21.vii.54; *Eupethecia venosata* Fab., bred ex larvae, Unst., 21.vii.54.

(2) Shown for Mr. R. C. EDWARDS of Westerham, Kent—*Atethmia xerampelina* Esp., Sussex, 12.ix.55; *Plusia iota* L., Westerham, 23.vii.55.

Mr. H. L. DOLTON—Three drawers of Coleoptera collected by the late F. W. Cocks of Reading. This famous collection is now in the Reading Museum.

Mr. R. C. DYSON—The following Lepidoptera:—*Leucania favigolor* Barr. A series from Hants., showing variation in ground colour, taken July 1955. *Jodia croceago* Schiff. A series bred from ova laid by a ♀ taken near Chiddingfold, 11.iv.55. *Hydraecia hucherardi* Mabille, taken at light in Sussex, September 1955. *Bupalus piniaria* L. Series bred from Sussex, wild larva taken September 1954 producing three ♂ specimens approaching the white Scotch form, and a ♀ with ♂ wing markings. *Heliothis peltigera* Schiff. Series bred in heated breeding cage from Sussex larva taken September 1955. *Calophasia lunula* Hufn. Series bred from Sussex larvae, found August 1955. *Argynnis selene* Schiff. A heavily marked aberration from Sussex, taken 5.vi.55. *Polyommatus icarus* Rott. A Sussex male with submedian spots much enlarged, taken 5.vi.55. *Lysandra coridon* Poda, a selection of specimens taken during 1955 in Sussex, Hants., and Wilts., including abs. *fowleri* South, *radiata* Courv., *syngrapha* Kef., *postobsoleta* B. & L., and a ♂ with a portion of the black border extending inwards.

Mr. R. C. EDWARDS.—See C. H. Dixon.

Canon T. G. EDWARDS—Lepidoptera captured or bred during 1955. SPHINGES—*Hyloicus pinastri* L., taken at light at Camber Sands, probably a migrant; BOMBYCES—*Harpyia furcula* Clerck, *Notodonta ziczac* L., *N. dromedarius* L., *Pterostoma palpina* Clerck, *Leucoma salicis* L. (bred), *Earias clorana* L., *Spilosoma urticae* Esp., *Mitochondria miniata* Forst., *Cybosia mesomella* L.; AGROTIDES—*Agrotis vestigialis* Hufn., *A. ripae* (Hb.), *Hadena suasa* Schiff. (*dissimilis* Knoch.), *H. lepida* Esp. (*carpophaga* Borkh.), *H. bicolorata* Hufn. (*serena* Schiff.), *Hama albicolon* Hb., *Apamea remissa* Hb., *A. ypsilon* Schiff., (*fissipuncta* Haw.), *Griposia aprilina* L. (bred), *Calophasia lunula* Hufn. (bred from Dungeness larvae), *Leucania littoralis* Curt., *Omphaloscelis lunosa* Haw., *Cucullia asteris* Schiff., *Jaspidia fasciana* L. (*pygarga* Hufn.), *Plusia festucae* L., *Catocala fraxini* L. (bred), *Colobochyla salicalis* Schiff., GEOMETRIDES—*Pseudoterpna pruinata* Hufn., *Pelurga comitata* L., *Euphyia luctuata* Schiff., *Eulype hastata* L., *Apeira syringaria* L. (second brood, bred), *Epione repandaria* Hufn. (*apiciaria* Schiff.) (bred); PYRALES—*Schoenobius forficellus* Thunb., *Psammotis crocealis* Hb., *Pyralis glaucinalis* L., *Synaphe angustalis* Schiff., *Anerastia lotella* Hb., *Platyptilia gonodactyla* Schiff.; TORTRICES—*Cacoecia aeriferana* H.-S. (at light, Camber), *Pandemis heparana* Schiff., *Tortrix costana* Fab., *Peronea variegana* Schiff., *Bactra furfurana* Haw., *Argyroploce lacunana* Dup., *Eucosma tripunctana* Fab., *E. citrana* Hb., *E. expallidana* Haw.; TINEIDES—*Aristotelia pictella* Zell., *Mompha ochraceella* Curt., *Prays curtisellus* Don., *Hyponomeuta variabilis* Zell. (Dungeness, on black-thorn, bred), *Ethmia terminella* Flet., *E. bipunctella* Fab. (Camber, at light), *Ypsolophus lucellus* Fab. (bred).

Mr. E. F. D. ELLISON—A series of *Rhodometra sacraria* L., taken at Freshwater, Isle of Wight, 2/3.x.55.

Mr. R. ELDON ELLISON—A selection of Lepidoptera taken in 1955 including:—*Apatura iris* L.; series of *Nola albula* Schiff., *Agrotis trux* Hb. s.sp. *lunigera* Steph., *Hydraecia hucherardi* Mab., *Mythimna turca* L. and *Euphyia luctuata* Schiff.; amongst migrants, or probable migrants, a series of *Rhodometra sacraria* L. and specimens of *Actebia praecox* L., *Laphygma exigua* Hb., *Graptolitha lapidea* Hb., *Heliothis peltigera* Schiff., *Nycterosia obstipata* Fab., *Semiothisa alternaria* Hb., *Palpita unionalis* Hb. Aberrations included *Arctia caja* L. ab. *muecki* Kromb., *Peridroma porphyrea* Schiff., ab. *nigrocosta* Tutt, *Leucania pallens* L., ab. *ectypa* Hb. and a dusky form apparently unnamed, *Plusia iota* L., ab. *percontationis* Treits., *Orthosia stabilis* View., ab. *juncta* Haw., *Atethmia xerampelina* Hb., ab. *unicolor* Stdgr. and a short series of *Biston betularia* L., ab. *insularia* Th.-Mieg.

Mr. L. J. EVANS—*Endromis versicolora* L., males assembled to an Aviemore female in Wyre Forest, Shropshire; *Amphipyra pyramidea* L., a strongly marked specimen taken at Sutton Park, Warwicks.; *Arctia caja* L., a short series, bred, showing variation in N. Birmingham examples; *Actebia praecox* L. and *Leucoma salicis* L., short series bred from Formby Sandhills; *Ellopia fasciaria* L., a short series bred from Cannock Chase; *Hydriomena furcata* Thunb., a short series bred from Salsey Forest; *Diarsia festiva* Schiff., a form taken at light at Sutton Park showing antemedian and postmedian lines joining at the costa and inner margin to form a circle.

Mr. R. FAIRCLOUGH—Moths caught or bred in 1955. (1) from the Kirkstone Pass, Westmorland, at 1,500 ft. *Xanthorhoë munitata* Hb., *Colostygia olivata* Schiff., *C. salicata* Hb., *Venusia cambrica* Curt., and *Eupithecia sobrinata* Hb. (2) Lancashire, *Thera cognata* Thunb. (Hawksbeard) and *Eustroma reticulata* Schiff. (Windermere). (3) Yorkshire, Grassington, *Phothedes captiuncula* Treits., *Perizoma minorata* Treits. s.sp. *ericetata* Curt., *Cnephasia bellana* Curt., *Entephria caesiata* Schiff., *Eupithecia valerianata* Hb. (bred). (4) Kent, *Calophasia lunula* Hufn. (bred), and *Hydraecia hucherardi* Mab. (5) Suffolk, *Anepia irregularis* Hufn. (bred). (6) Farnboro', Hants., *Galleria mellonella* L. (7) *Palpita unionalis* Hb., a ♀ taken at Box Hill, Surrey, 27.viii.55, which refused to lay and a pair taken by Mr. S. W. P. Pooles at Coverack, Cornwall, in September 1955. (8) *Loxostege sticticalis* L. taken at Leigh, Surrey, 14.viii.55 and a second at Dungeness, Kent, 19.viii.55, more proof of this insect's wanderings this year. (9) *Parascotia fuliginaria* L. from an unexpected locality—larva found on a piece of oak, 19.v.55, in a garden at Leigh, Surrey, on Weald clay. Very unlikely that it was accidentally introduced.

Mr. IAN G. FARWELL—(1) Aberrations of British butterflies as follows: (a) *Lysandra coridon* (Poda), male undersides abs. *postcaeca* B. & L., *anticaeca* B. & L. and *antistriata* B. & L.; male upperside abs. *inframarginata* B. & L. and *pallidula* Tutt; female underside ab. *obsoleta* Tutt, from Dorset, August 1955. (b) *Lysandra bellargus* (Rott.), female underside ab. *caeca* B. & L. also female upperside abs. *flavescens* Tutt (?), *albocuneata* B. & L. and *semiceronus* Tutt., from Dorset,

September 1955. (c) *Lycaena phlaeas* (L.) a female ab. *pallidula* B. & L., from Dorset, 24.ix.55.

(2) Living examples of *Arctia caja* L., part of second brood (1955) from typical female taken at mercury vapour light in July. Larvae reared on Dandelion, kept indoors with the temperature between 60° and 70° F. Approximately 2% only hibernated. First pupated 5.ix.55; first imago emerged 1.x.55.

Mr. R. W. FAWTHROP—See A. M. MORLEY.

Mr. J. FIRMIN—(1) A series of 7 male and 12 female specimens of *Hadena compta* (Schiff.) reared from ova and larvae originally discovered by the exhibitor at Colchester in June 1954. Two aberrational forms were also shown. (2) A ♀ aberration of *Carterocephalus palaemon* Pall. captured in Northants. 26.v.54, having the upper wings uniform chocolate brown, and the lower wings heavily striated with yellow (Plate II, fig. 9).

MESSRS. J. F. D. FRAZER, G. H. MORGAN, E. G. PHILP and A. W. TYNAN—Some results of the survey of butterflies of Burham Down, carried out on behalf of the Kent Field Club. Species taken there, with a model of the area and some figures of population numbers.

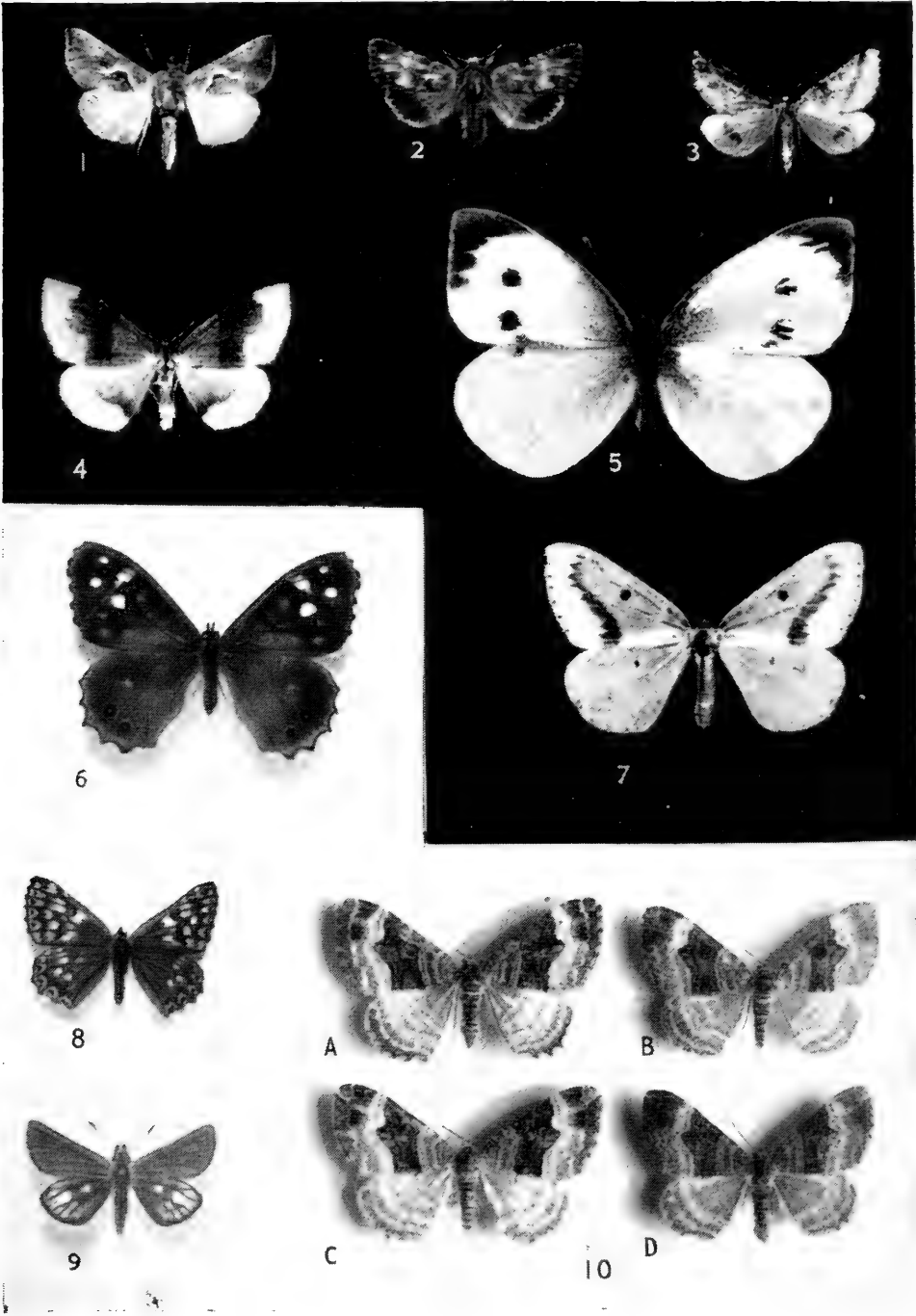
Mr. BRIAN O. C. GARDINER—See CLAUDE F. RIVERS.

Mr. A. E. GARDNER—The following species collected from the Camargue, Bouches du Rhône, 19/25.ix.55:—Orthoptera—*Mantis religiosa* L., *Iris orotaria* (L.), *Tylopsis lilifolia* (Fabr.), *Phaneroptera quadripunctata* Brunner, *Homorocoryphus nitidulus* (Scop.), *Conocephalus conocephalus* (L.), *Platycleis tessellata* (Charp.), *P. sabulosa* Azam, *P. affinis* Fieber, *Gryllus campestris* L., *G. bimaculatus* De Geer, *Oecanthus pellucens* (Scop.), *Decticus albifrons* (Fabr.), *Gryllotalpa gryllotalpa* (L.), *Paratettix meridionalis* (Ramb.), *Tetrix ceperoi* (Bol.), *Locusta migratoria* L., *Anacridium aegyptium* (L.), *Acrotylus insubricus* (Scop.), *Oedipoda coerulescens* (L.), *Oedaleus decorus* (Germ.), *Calliptamus italicus* (L.), *Acrida mediterranea* Dirsh, *Parapleurus alliaceus* (Germ.), *Paracinema tricolor bisignata* (Charp.), *Aiolopus strepens* (Latr.), *A. thalassina* (Fabr.), *Euchorthippus declivus* (Bris.), *Omocestes ventralis* (Zett.), *O. viridulus* (L.), *Ectobius vittiventris* (Costa). Odonata:—*Anax parthenope* Selys, *Sympetrum depressiusculum* (Selys), *S.*

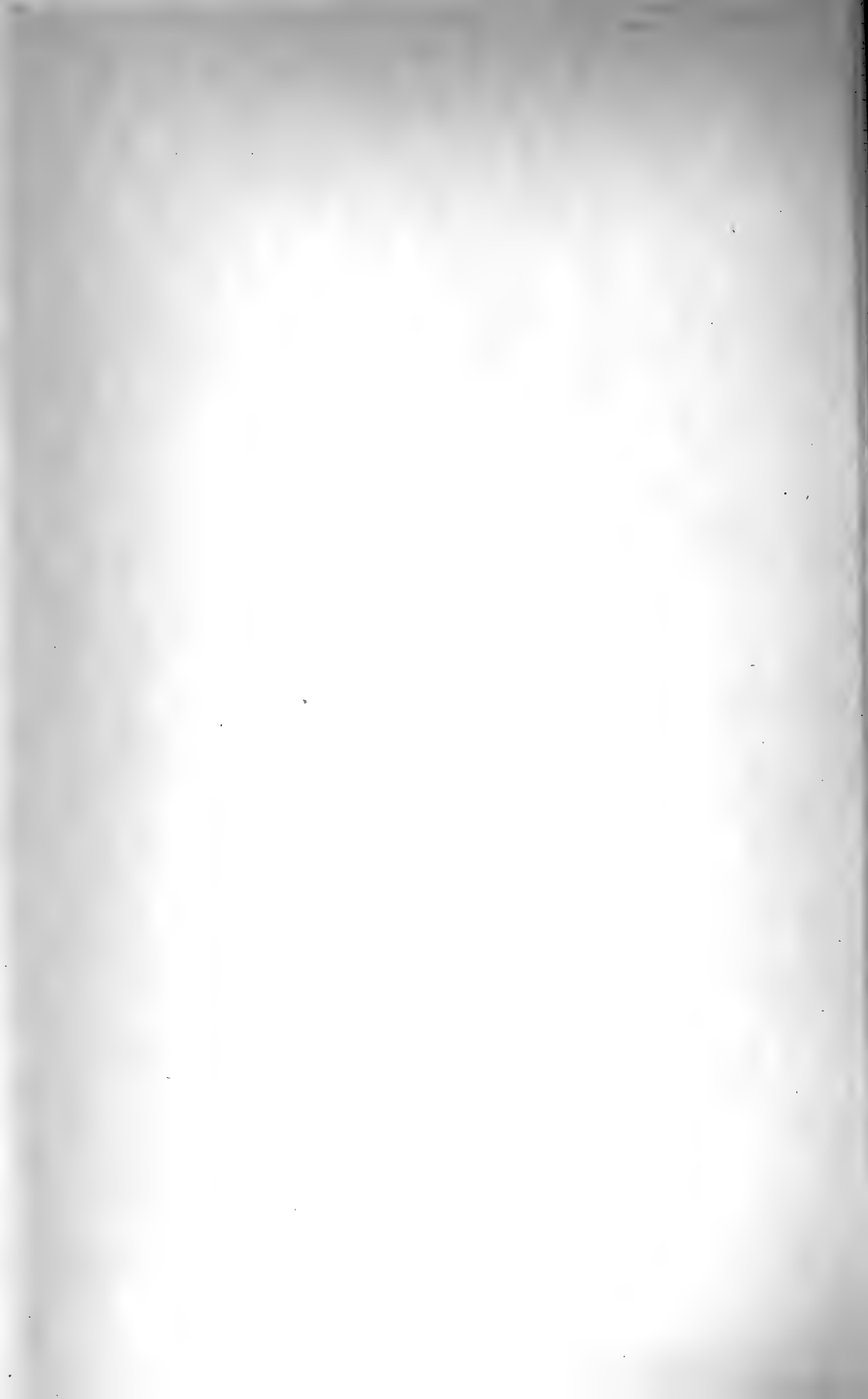
#### ANNUAL EXHIBITION, 29th October 1955.

1. *Plusia confusa* Steph. Mr. Robin M. Mere. 2. *Calophasia lunula* Hufn. ab. nov. Mr. Austin Richardson. 3. *Aspitates ochrearia* Rossi, an asymmetrical var. Mr. G. A. Cole. 4. *Anagoga pulveraria* L. ab. Mr. A. L. Goodson. 5. *Pieris brassicae* L. homoeosis, Mr. Brian O. C. Gardiner. 6. *Pararge aegeria* L. melanic ab. Mr. R. E. Stockley. 7. *Abraxas grossulariata* L. pale cream ab. Mr. P. J. Burton. 8. *Hamearis lucina* L. gynandromorph, Mr. H. J. Turner. 9. *Carterocephalus palaemon* Pall. ab. Mr. J. Firmin. 10. *Xanthorhoë biriviata* Borkh., a. & c. spring form, typical, b. & c. summer form, ab. *aestiva* Fuchs.

(NOTE.—Figs. 1-9 are reduced, but fig. 10 is a little larger than life.)



[Photos, 1-9 W. H. T. Tams, 10 W. E. Minnion.





*meridionale* (Selys), *S. fonscolombeii* (Selys), *Crocothemis erythraea* Brullé, *Agrion haemorrhoidalis* Van der Lind., *Ischnura pumilio* (Charp.). Lepidoptera:—*Pontia daplidice* (L.), *Everes argiades* (Pall.), *Cyaniris semiargus* (Rott.), *Cymbalophaga pudica* Esp., *Agrotis spinifera* (Hb.), *Laphygma exigua* (Hb.), *Leucania unipuncta* (Haw.), *L. loreyi* (Dup.), *L. vitellina* (Hb.), *L. l-album* (L.), *Plusia chalcites* (Esp.), *Cosymbia puppillaria* Hb., *Rhodometra sacraria* (L.). Living specimens of the following:—Dermoptera: *Labidura riparia* (Pall.) taken on the sandy banks of the Rhône at Trinquetaille, 23.ix.55. Orthoptera:—*Gryllotalpa gryllotalpa* (L.) one of six Mole crickets which flew into the hotel to light, Trinquetaille, 24.ix.55. Lepidoptera:—Larvae of *Papilio m. machaon* L., Fourques, 24.ix.55. Also *Euscorpius* sp., found in a street at Arles, 23.ix.55, and the Green Tree Frog, *Hyla a. arborea* (L.), Salin de Badon, 22.ix.55. Orthoptera collected by Mr. and Mrs. F. T. Vallins from the Hautes-Alpes, Dauphiné, June and July, 1955:—*Oedipoda germanica* (Latr.), *O. coerulescens* (L.), *Sphingonotus coerulans* (L.), *Psophus stridulus* (L.), *Arcyptera fusca* (Pall.), *Stenobothrus lineatus* (Panz.), *Stauroderus scalaris* (Fisch. Waldh.), *Podisma pedestris* (L.), *Tettigonia cantans* (Fuessly), *T. viridissima* L., *Decticus verrucivorus* (L.). Also the following British species taken by Mr. Gardner:—Lepidoptera—A series of *Hydraecia hucherardi* Mabilie with preserved larva and pupae bred from larvae taken in E. Sussex, 15.viii.55; a series of *Parascotia fuliginaria* (L.) with preserved larva and pupae bred from larvae found at Wisley, Surrey, 18.v.55. Odonata:—Specimens of *Aeshna isosceles* (Müll.) taken at Potter Heigham, Norfolk, 9.vii.55, *Somatochlora metallica* (Van der Lind.), Surrey, 31.v.55; *Leucorrhinia dubia* (Van der Lind.), from a new and flourishing colony in Surrey, 31st May, a series of the rare migrant *Sympetrum flaveolum* (L.), Rye, Sussex, 15th August, Wimbledon Common, Surrey, 8th September, Wisley, Surrey, 9th September. A series of the rare *Ischnura pumilio* and females var. *aurantiaca* Selys bred August 1955, from eggs obtained from a female taken 19.vii.54, by Mr. J. Cowley from the Oberwater, Burley, Hants. A ♂ *Sympetrum nigrescens* Lucas bred from a larva from Skelbo, Sutherland, July 1954, ♂ *S. s. striolatum* (Charp.), Wimbledon, Surrey, 6.ix.55, for comparison and drawings of the male hamules of both species. A male *S. meridionale* (Selys) Dawlish, Devon, 1901, found in the collection of the late H. W. Turner, also a ♂ from Salin de Badon, Bouches du Rhône, 22.ix.55, to show the natural coloration. Previous records of this species consist of two females of old date.

Mr. A. E. GARDNER and Mr. E. W. CLASSEY—A series of the moth *Luperina dumerilii* (Dup.) from Trinquetaille, Bouches du Rhône, 24/25.ix.55. This species was common at light and exhibited a wide range of colour variation.

Mr. B. S. GOODBAN—See W. E. MINNION.

Mr. A. L. GOODSON—See H. B. D. KETTLEWELL.

Mr. F. GOODLIFFE exhibiting on behalf of Mr. G. E. SCHMOLLE—Three *Menophra abruptaria* Thunb. from typical to melanic, also com-



parison of two *Lycaena phlaeas* L. taken during May in Surrey and Gibraltar.

Mr. M. P. GOOSEMAN—Specimens, mostly aberrations, of the following species of lepidoptera:—*Hepialus hecta* L., *Rusina umbratica* Goeze, *Enargia paleacea* Esp., *Hydraecia hucherardi* Mab. (an example bred from a larva collected at Rye, Sussex, 1955), *Agrotis segetum* Schiff., *A. ipsilon* Hufn., *Conistra vaccinii* L., *Agrochola lota* Clerck, *Eupsilia transversa* Hufn., *Allophyes oxyacanthae* L., *Xylena exsoleta* L., *Tholera cespitis* Schiff., *Gonodontis bidentata* Clerck, *Maniola jurtina* L., *Lysandra coridon* Poda, *Lycaena phlaeas* L., *Pieris napi* L. and *Colias croceus* Fourc.

Mr. A. W. GOULD—Coleoptera: *Amara strenua* Zimm., Faversham, Kent, June 1955. *Helops coeruleus* L., Woolwich, S.E.18, July 1953; this local beetle is fairly plentiful at Borstall Woods, S.E.18, and frequently enters houses during summer evenings. *Cassida sanguinolenta* Mull., Horsley, Surrey, May 1953, and a var. without the usual red markings on the elytra from Ivythorn, Somerset, September 1953. *Antherophagus silaceus* Hbst., Sutton-at-Hone, Kent, September 1955. *Falagria thoracica* Curt., Faversham, Kent, June 1955. *Mordella aculeata* L., Cobham, Kent, May 1955. *Arhopalus fesus* Muls. (= *Criocephalus polonicus* Mots.), Witley, Surrey, August 1950. *Tanymecus palliatus* F., Ashted, Surrey, June 1950. *Oëdes helopioides* F., Boldre, Hants, October 1955.

Mr. E. GOWING SCOPES—Examples of Australian Coleoptera.

Mr. G. HAGGETT—Lepidoptera taken or bred during 1955. *Arctia caja* L., male with deep yellow hindwings and aberrant forewing markings, also a female with strongly developed white forewing reticulation, Arundel, Sussex; *Spilosoma lubricipeda* L., very light spotted and well streaked examples, Arundel; *Apatele rumicis* L., a male ab. *salicis* Curt., Ham Street, Kent, and a pale mottled female, Arundel; *Agrotis segetum* Schiff., a male with black suffused forewings, Arundel; *Diarsia festiva* Schiff., two aberrations showing remarkable development of antemedian and postmedian lines, Arundel; *Triphaena pronuba* L., a brown male with right side of collar bleached, Arundel; *Tathorhynchus exsiccata* Led., a female taken at mercury vapour light, Arundel, 2.vi.55; *Scopula rubiginata* Hufn., a male taken at mercury vapour light, Arundel, 18.viii.55; *Cosymbia punctaria* L., second brood female aberration with grey suffusion as a broad terminal band on all wings, Storrington, Sussex; *Hydriomena furcata* Thunb. and *Chloroclystis debiliata* Hb., series bred from larvae on bilberry, Tintern, Monmouthshire; *Lithina chlorosata* Scop., a deeply marked male, Tilgate, Sussex; *Eulia formosana* Geyer, large male, Storrington.

Joint exhibit with J. WIGHTMAN—*Hydraecia hucherardi* Mab., a long series of moths caught wild and bred from wild larvae and pupae, Rye, Sussex.

Mr. H. E. HAMMOND—Two cases containing a selection from larvae preserved during 1954-5, 76 species including a number of melanic and varietal forms.

Mr. E. J. HARE—(1) From County Clare, Ireland, July 1955; *Hadena caesia* Schiff. two bred specimens; *Procus fasciuncula* Haw. aberration; *Hypercallia christiernana* L. (2) From Unst, Shetland, August 1955; a short series of *Amathes glareosa* Esp. ab. *edda* Stdgr., and grey form; *Diarsia festiva* Schiff. ab. *thulei* Stdgr.; *Lygris testata* L. and *L. populata* L. ab. *musauaria* Frey., also an aberration of *Xanthorhoë fluctuata* L. (3) From South Devon, a pale male *Colias croceus* Fourc. and a specimen of *Plusia chalcites* Esp. taken 23.ix.55 and 21.ix.55 respectively. (4) From his garden at Pinden, Kent; *Gastropacha quercifolia* L., July 1955, and *Agrochola lychnidis* Schiff., two examples, September and October 1954, with partial bleaching of one forewing.

Commander G. W. HARPER, R.N.—(1) Coleoptera: a specimen of *Trichius fasciatus* L., taken in Inverness-shire feeding on the blossom of a Melancholy Thistle. (2) Lepidoptera: (a) nine species, new records for the Badenoch district of Inverness-shire; *Orthosia cruda* Schiff., *Axyia putris* L., *Gortyna petasitis* Doubl., *Lampra fimbriata* Schreb., *Actebia praecox* L., *Hepialus hecta* L., *Loxostege sticticalis* L., *Palpita unionalis* Hb., *Rhodometra sacraria* L., the last two are believed to be furthest north records also. (b) A short bred series of *Dysstroma citrata* L., from a female ab. *cjornensis* Walker (Prout), showing 50% of this usually rare form among the offspring, also captured specimens and ab. *insolida* Prout, another uncommon form; a bred series of *Plemyria rubiginata* Schiff. (*bicolorata* Hufn.) 100% ab. *fumosa* Prout from parents of which the male was ab. *fumosa* but the female was *rubiginata*. (c) Series taken in East Anglia during July and August 1955, including *Pelusia muscerda* Hufn., *Eilema pygmaeola* Doubl., *Arenostola elymi* Treits., *A. phragmitidis* Hb., *A. fluxa* Hb., *A. brevilinea* Fenn, *Nonagria neurica* Hb., *Coenobia rufa* Haw., *Leucania straminea* Treits., *Bombycia viminalis* Fab. and *Hadena suasa* Schiff.

Mr. M. W. HARPER—Lepidoptera bred or captured in the wild between 1949 and 1955, showing natural variation. (1) Sussex—*Agrotis exclamationis* L., *A. denticulata* Haw. (*cinerea* Schiff. nec Hufn.), *Spilosoma lubricipeda* L., *Arctia villica* L., *Colotois pennaria* L., *Crocallis elinguaris* L., *Erannis defoliaria* Clerck and *Ochropleura plecta* L., the last being a remarkable melanic variation in this normally invariable species. (2) Inverness-shire—*Orthosia incerta* Hufn., *Cirrhia icteritia* Hufn., *Chesias rufata* Fab., s.sp. *scotica* Richardson and a rare variety approaching the English form; *Epirrhoë alternata* Müll., *Cabera exanthemata* Scop., *Entephria caesiata* Schiff. and a short series of *Orthosia stabilis* Schiff. showing a range of natural variation in this area, and a further example exhibiting asymmetrical coloration.

Mr. J. L. HENDERSON—Hydradeptera (Col.): the genera *Brychius*, *Haliphys*, *Peltodytes*, *Hygrobia*, *Noterus*, *Laccophilus*, *Hydrovatus*, *Hyphydrus*, *Bidessus*, *Hygrotus*, *Deronectes*, and *Oreodytes* which included all the British species with the exception of *Deronectes canariensis* Bedel and *D. griseostriatus* Deg.

Mrs. E. A. HESLOP—(1) *Apatura iris* L., a perfect male specimen taken by the exhibitor in Wiltshire, 28.vii.55, and a very large and

perfect male also taken in Wiltshire by Miss Jane Heslop, aged 5 years and 4 months. (2) *Lysandra bellargus* Rott., a female aberration, having the normal red lunules of the upper side replaced by white, taken in Dorset, 4.ix.55, also by Miss Jane Heslop. (3) *Vanessa cardui* L., a male aberration having a symmetrical light patch on the forewings, taken by Miss Margaret Heslop, aged 10 years, in Dorset, 9.ix.55. (4) *Catocala nupta* L., a very large female specimen over 3½ inches in wing span, taken in the exhibitor's garden at Burnham-on-Sea, Somerset, 16.x.54, by Master John Heslop, aged 6 years and 7 months.

Mr. I. R. P. HESLOP—The following Lepidoptera all taken during 1955 by the exhibitor. (1) *Pieris rapae* L., a female aberration, taken in Dorset on 9th September, having the yellow of the underside exceptionally extensive and deep in tone; the upper side is pale buff and in flight had the general appearance of a *Colias*. (2) *Colias hyale* L., a male taken in Wiltshire on 26th September. (3) *Aglaia urticae* L., a remarkable aberration, extreme *bellieri* Cabeau (*alba* Raynor nec Cosmovici), having the usual orange-tawny ground colour entirely replaced by pure white. This type of variation, usually known as "the white variety", has been recorded in the Large Tortoiseshell and the Comma, but is of excessive rarity. The specimen, a male, was taken flying among several thousands of typical *urticae* on lucerne in the exhibitor's grounds at Burnham-on-Sea, Somerset, on 20th August. (4) *Limenitis camilla* L., a large female ab. *semi-nigrina* Tutt taken in Wiltshire on 1st August. (5) *Apatura iris* L., seven males (one bred and six wild) taken in Wiltshire. The wild specimens taken on dates ranging from 13th to 29th July, one being in as perfect condition as the bred specimen which emerged on 8th July.

Mr. T. J. HONEYBOURNE—Three cages of larvae of Indian moths, *Antheraea mylitta* Drury, *Philosamia ricini* Donovan, and *Antheraea pernyi* Guer. × *roylei* Moore hybrids. Also a case containing male and female *P. ricini*, male and female *A. mylitta* with their cocoons and a female *Loepa katinka* Westw. with misshapen eye mark on the left forewing.

Mr. J. O. T. HOWARD—(1) *Celerio galii* Schiff., a female taken in a light trap at Dorking, Surrey, 29.vii.55, and a series of moths bred during September from eggs laid by her (1955, *Ent. Rec.*, **67**: 235 and 277). (2) *Hadena conspersa* Schiff., a series varying from normal through ochreous to slaty grey bred in 1955 from larvae taken on bladder campion at Mullion Cove, Cornwall, in June 1954. (3) *Deuteronomos alniaria* L., a specimen with smoky grey wings and body and normal thorax taken at light at Dorking, Surrey, 27.viii.55.

Mr. and Mrs. T. G. HOWARTH—*Thaumatomyia notata* Meigen (DIPTERA). Specimens from a swarm on a ceiling of a first floor room at Arkley, Hertfordshire. This Dipteran and other allied species often appear in abundance in the Autumn in similar situations, sometimes only infesting one room in a house. This phenomenon may be due to

aerial convection currents and eddies lifting the insects to a sufficient height where they may find a convenient opening. In one instance they were found in a room on the *sixth* floor (from ground level) in the Entomological Block of the Brit. Mus. (Nat. Hist.). The adult insects show a certain amount of phototropism in that they tend to remain near a window during the day and then after dark will *walk* towards another light source. It would seem as if not much is known about the early stages but apparently it lives in species of grass.

Mr. G. E. HYDE—Lepidoptera as follows:—*Lampra fimbriata* Schreb. S. E. Yorks., bred July 1955; *Xanthorhoë fluctuata* L., S. Yorks., May 1955; *Argynnis aglaia* L. N. Lincs., July 1955; *Coenonympha tullia* Müll., S. Yorks., July 1955; *C. pamphilus* L., N. Lincs., July 1955; *Aphantopus hyperantus* L., N. Lincs., July 1955; *Lysandra coridon* Poda, Sussex, August 1955; *Polyommatus icarus* Rott. ab. *ultra-radiata* B. & L., S. Yorks., June 1944, and a number of photographs of British Lepidoptera.

Captain R. A. JACKSON—Lepidoptera: A very small male *Philudoria potatoria* L., expanding only  $1\frac{1}{4}$  inches, taken at light; a female *Agrotis ipsilon* Hufn., forewings with very pale outer margins and sooty black median area; a male *Eurois occulta* L. of the dark northern form taken at Codford, Wilts., 31.vii.55; a short series of *Bupalus piniaria* L. ab. *funebria* Ckne., taken at Blackdown, near Camberley, Surrey, and a female of a dingy drab-brown colour; a male *Ellopija fasciaria* L.; also from Blackdown, of a dull brown slightly tinged with red; a bred female *Euphyia luctuata* Schiff. from Ham Street, Kent, without the dark central band, the other dark markings a rather washy grey colour.

Dr. H. B. D. KETTLEWELL and Mr. A. L. GOODSON—The following Lepidoptera from the Rothschild-Cockayne-Kettlewell Collection: *Anaplectoides prasina* Schiff. ab. with banded forewings, Birmingham, July 1955, H. B. D. Kettlewell; *Eurois occulta* L., three specimens, probable migrants, taken at Tring and Oxford, August 1955, Goodson and Kettlewell; *Triphaena pronuba* L. ab. *nigribasalis* Cockayne, Tring, August 1955, Goodson; *Plusia gamma* L., with aberrant "Y" mark, Tring, August 1955, Goodson; another small melanic specimen with the appearance almost of a separate species, taken at Freshwater, October 1955, Kettlewell; *Mamestra brassicae* L., with suffused markings, Tring, June 1955, Goodson; *Amathes xanthographa* Schiff., with the stigmata yellow and united, Tring, August 1955, Goodson; *A. c-nigrum* L., ab. nov., with the normal costal markings much suffused, Oxford, October 1954, Kettlewell; *A. c-nigrum* ab. *albinotica* Cockayne, albino form, one from Tring, Goodson, September 1955, another from Feltham, September 1955, E. W. Classey; *Diarsia brunnea* Schiff., with large oval areas on the forewings devoid of scales and symmetrically shaped, Birmingham July 1955, Kettlewell (Plate III, fig. 4); *D. festiva* Schiff., ab. with few markings, Tring, July 1955, Goodson; *Agrotis exclamationis* L., a selection of unusual aberrations taken at Tring, June and July 1955, Goodson; *Spilosoma lubricipeda* L., a selection of colour forms taken at Tring, one with brown grey forewings, June 1955,

Goodson; and another with large spots and some striation, Feltham, June 1955, Classey; *Agrochola lychnidis* Schiff., a very dark ab., Freshwater, October 1955, Goodson; *Lithophane lapidea* Hb., taken at mercury vapour light in the Isle of Wight, October 1955, Kettlewell; *Hydraecia paludis* Tutt, extremely pale, Feltham, August 1955, Classey; *H. hucherardi* Mab., a series bred from larvae taken wild in the roots of *Althaea officinalis* L., near Rye, Sussex, in July 1955, emerging in August and September 1955, Goodson; also an aberration showing no markings on the forewings, Rye, 1955, bred from larva, Goodson; and an ab. *fuscoquadrata* Goodson, a second specimen of this aberration described from a wild caught one in 1954, bred from larva taken at Rye, August 1955, Goodson; *Biston betularia* L., with the forewings black and the hindwings pale dove grey, bred from mixed parents, April 1955, Kettlewell; and a series showing a varying degree of brown suffusion at the base of the forewings. This brood, in the pupal state, was subjected to a cold water application during great heat. Bred from Plymouth × Oxford parents, June 1955, Kettlewell; *Rhizedra lutosus* Hb., a selection of forms taken at Freshwater, October 1955, Kettlewell and Goodson; *Anagoga pulveraria* L., aberration with the base of the forewings darkened and the margins very bright yellow, Tring, June 1955, Goodson (Plate II, fig. 4).

Dr. KETTLEWELL showed three drawers of melanics in the Lepidoptera, from the Rothschild-Cockayne-Kettlewell Collection at present at Tring Museum, which fell into three categories: (1) Industrial Melanics, (2) Rare Recessive Melanics, and (3) Geographic Melanics.

(1) Industrial Melanics. These are for the most part insects which survive throughout the day time due to their cryptic protective coloration. 70 species with their melanics were shown, the majority of which could be classed as "Industrial Melanics", their inheritance therefore being as simple Mendelian dominants. *Lymantria monacha* ab. *atra* is, however, multifactorial, and the melanic forms of *Polia nebulosa*; *robsoni*, and *thompsoni*, are, in fact, the heterozygote and homozygote melanics respectively. In some cases, the genetics are unknown and, in others, it can be said that they may not be considered as of industrial origin, but nevertheless they represent melanics which are occurring in the population at a greater frequency than the mutation rate. The following is a list of species with their melanic forms:—

*Stauropus fagi* L. ab. *obscura* Rebel.; *Tethea ocularis* L. ab. nov.; *T. or* Schiff. ab. *albigensis* Warnecke; *T. duplaris* L. ab. *obscura* Tutt; *Dasychira pudibunda* L. ab. *concolor* Stdgr.; *Lymantria monacha* L. ab. *atra* Linstow; *Nola cucullatella* L. ab. *fuliginalis* Steph.; *Celama confusalis* H.-S. ab. *columbina* Image; *Orthosia populeti* Fab. ab. *nigra* Tutt; *O. cruda* Schiff. ab. *haggarti* Tutt; *O. advena* Schiff. ab. *nigra* Lempke; *Polia nebulosa* Hufn. ab. *robsoni* Collins and ab. *thompsoni* Arkle; *Bombycia viminalis* Fab. ab. *unicolor* Tutt; *Allophyes oxyacanthae* L. ab. *capucina* Millière; *Antitype chi* L. ab. *suffusa* Robson and ab. *nigrescens* Tutt; *Cryphia perla* Schiff. ab. *suffusa* Tutt; *Apatele leporina* L. ab. *melanocephala* Mansbridge; *A. psi* L. ab. *suffusa* Tutt;

*A. alni* L. ab. *steinerti* Caspari; *A. aceris* L. abs. *infusata* Haw, *candelisequa* Esp. and *intermedia* Tutt; *A. megacephala* Schiff. ab. *nigra* Shaw; *A. menyanthidis* Schiff. ab. *suffusa* Tutt; *A. rumicis* L. ab. *lugubris* Schultz; *Craniophora ligustri* Schiff. ab. *coronula* Haworth; *Apamea monoglypha* Hufn. ab. *obscura* Th-Meig.; *A. crenata* Hufn. ab. *nigrorubida* Tutt; *A. oblonga* Haw. ab. *fribolus* Boisd. and ab. *nigricans* Freyer; *A. remissa* Hb. ab. *obscura* Haworth; *A. secalis* L. ab. *nigra-flavo* Tutt; *Procus strigilis* Clerck ab. *aethiops* Osthelder; *P. latruncula* Schiff. ab. *unicolor* Tutt; *P. literosa* Haw. ab. *aethalodes* Richardson; *Luperina testacea* Schiff. ab. *nigrescens* Tutt; *Nonagria geminipuncta* Haw. ab. *fusca-unipunctata* Tutt; *N. dissoluta* Treits. (the melanic is the type) ab. *arundineta* Schmidt. (typical); *N. typhae* Thunb. ab. *fraterna* Borkh.; *Sarrothripus revayana* Scop. ab. *nigrescens* Sheldon; *Colocasia coryli* L. ab. *melanotica* Haverkamp; *Abrostola tripartita* Hufn. ab. *plumbea* Cockayne; *Cosymbia albipunctata* ab. *subroseata* Woodforde; *Sterrhia seriata* Schrank ab. *cubicularia* Peyer; *Operophtera brumata* L. ab. *harrisoni* Prout; *Oporinia dilutata* Schiff. abs. *melana* Prout, *regressa* Harrison and *latifasciata* Prout melanic forms; *O. autumnata* Borkh. ab. *latifasciata* Vorbr. melanic form; *Thera obeliscata* Hb. ab. *obliterata* Buchanan-White; *T. juniperata* L. ab. *infusata* Schwingenschuss; *Dysstroma truncata* Hufn. ab. *melaina* Müller; *D. citrata* L. ab. *nigerimma* Schawerda; *Colostygia multi-strigaria* Haw. ab. *nubilata* Tutt; *Hydriomena ruberata* Freyer ab. *nigrocastanea* Cockayne; *Venusia cambrica* Curt. ab. *bradyi* Prout; *Hydrelia testacea* Don. ab. *goodwini* Bankes; *Eupithecia abbreviata* Steph. ab. *nigra* Cockayne; *E. lariciata* Freyer ab. *nigra* Prout; *E. nanata* Hb. ab. *oliveri* Prout; *E. innotata* Hufn. ab. *unicolor* Prout; *Chloroclystis rectangulata* L. ab. *anthrax* Dietze; *Anticollis sparsata* Treits. ab. *obscura* Lempke; *Abraxas sylvata* Scop. ab. *obscura* Tutt; *Gonodontis bidentata* Clerck ab. *nigra* Prout; *Semiothisa liturata* Clerck ab. *nigrofulvata* Collins; *Erannis aurantiaria* Hb. ab. *fumipennaria* Hellwegwer; *E. marginaria* Fab. ab. *fuscata* Harrison; *E. defoliaria* Clerck ab. *nigra* Bandermaun; *Phigalia pilosaria* Schiff. (*pedaria* Fab.) ab. *uniformata* Lempke; *Biston strataria* Hufn. ab. *robinaria* Frings; *B. betularia* L. ab. *carbonaria* Jordan and ab. *insularia* Th-Mieg; *Menophra abruptaria* Thunb. ab. *fuscata* Tutt; *Cleora rhomboidaria* Schiff. ab. *nigra* Adkin; *Deileptenia ribeata* Clerk ab. *nigra* Cockayne; *Alcis repandata* L. ab. *nigra* Tutt; *Pseudoboarmia punctinalis* Scop. ab. *humperti* Humpert; *Boarmia roboraria* Schiff. ab. *melaina* Schultz and ab. *infusata* Stdgr.; *Ectropis crepuscularia* Hb. ab. *nigra* Th-Mieg. and ab. *delamerensis* Buchanan-White; *E. consonaria* Hb. ab. *nigra* Bankes.

(2) Recessive Melanics. These generally occur in the population at mutation rate frequently in species depending for their survival on mechanisms other than coloration. *Lasiocampa quercus* L. ab. *olivacea* Tutt; *Endromis versicolora* L. ab. *lapponica* Bau.; *Arctia caja* L. ab. *clarki* Tutt and others were shown.

(3) Geographic Melanics. These are, for the most part, limited to



primeval forests and moors of Scotland, also the west coasts of Scotland, Ireland and Cornwall. *Amathes glareosa* Esp. s.sp. *edda* Stdgr.; *Ortholitha mucronata* Scop. s.sp. *scotica* Cockayne ab. *nigrescens* Cockayne; *O. plumbaria* Fab. ab. *nigrescens* Cockerell; *Spilosoma lubricipeda* L. ab. *brunnea* Obth. and others were shown.

Dr. HAROLD KING—Lepidoptera:—*Eupithecia trisignaria* H.-S., bred from Forest of Dean larvae; *E. virgaureata* Dbld. bred from larvae collected in N. Wales by Mr. B. B. Snell and showing melanism in 80%. *Ceramica pisi* L., an aberration with pale borders to the wings, taken in Dorset. (Plate III, fig. 3).

Mr. J. R. LANGMAID—Lepidoptera taken at: (1) Southsea, September 1954, *Leucania unipuncta* Haw. melanic ab. (Plate III, fig. 12) and *Ennomos autumnaria* Wernb. (2) Southsea, 1955, *Cryphia divisa* Esp. (*raptricula* Hb.), the second British example (Plate III, fig. 10) and *Agrotis exclamationis* L. ab. (3) near Havant, July 1955, *Nola albula* Schiff. and *Mythimna turca* L. (4) Freshwater, October 1955, *Eumichtis lichenea* Hb., *Dasypolia templi* Thunb. and a series of *Rhodometra sacraria* L.

Mr. G. E. LAW—(1) A short series of *Amathes glareosa* Esp. (including ab. *edda* Stdgr.), *Diarsia festiva* Schiff. s.sp. *thulei* Stdgr., *Entephria caesiata* Schiff., *Lygris populata* L. and *L. testata* L. from Unst, Shetland, August 1955. (2) Bred series of *Euphyia luctuata* Schiff. with aberrations. (3) Series of *Cryphia perla* Schiff. aberrations from various Kent localities. (4) A short series *Calamia tridens* Hufn. from Co. Clare, Ireland, August 1953. (5) Four *Calophasia lunula* Hufn. bred, Dungeness, Kent. (6) *Abraxas grossulariata* L. ab. *dohrnii* Koenig (*lacticolor* Raynor) taken wild at Horton Kirby, Kent, 7.viii.46.

Mr. M. J. LEECH—(1) From the Burren, Co. Clare, Ireland: A selection of Lepidoptera taken between 6 and 13.viii.55, inclusive, consisting of: *Maniola jurtina* L. s.sp. *iernes* Graves, *Ammogrotis lucerneae* L., *Triphaena janthina* Schiff., *Hadena lepida* Esp. (*carpophaga* Bork.), *Thalpoephila matura* Hufn., a long series of *Calamia tridens* Hufn. (*virens* L.), two bred specimens of *Aporophyla lutulenta* Schiff. ab. *sedii* Guenée obtained from pupae under moss on the limestone terrace, *Amathes castanea* Esp., *Ortholitha chenopodiata* L., *Triphosa dubitata* L., *Lygris testata* L., *Cidaria fulvata* Forst., *Colostygia salicata* Hb., *Epirrhoë tristata* L., *E. alternata* Müll., *Perizoma albulata* Schiff., *Abraxas grossulariata* L. (well marked, dark specimens), *Aspitates gilvaria* Schiff. s.sp. *burrenensis* Ckne., *Gnophos myrtillata* Thunb. and *Selidosema brunnearia* Vill. (2) From North Wales: *Plebejus argus* L. s.sp. *caernensis* Thompson, *Nudaria mundana* L., *Amathes ashworthii* Dbld., *Agrotis trux* Hb. s.sp. *lunigera* Steph., *Apamea furva* Schiff. two specimens taken off heather blooms, a bred series of *Oleora cinctaria* Schiff. with specimens from Struan, Perthshire, for comparison, *Gnophos obscurata* Schiff. and *Sterrha eburnata* Wocke. (3) From Formby, Lanes.: *Procus strigilis* Clerck a varied series, *Pyrrhia umbra* Hufn., a series of *Plemyria rubiginata*

Schiff. (*bicolorata* Hufn.) taken from the alder carrs and a representative series of *Selenia bilunaria* Esp. showing examples of the F.1 and F.2 generations both upper and undersides. (4) From Delamere, Cheshire, specimens of *Apocheima hispidaria* Schiff. taken at mercury vapour light in March, 1955. (5) From the Witherslack, Westmorland, district: Bred specimens of *Apeira syringaria* L., *Anticlea derivata* Schiff., *Plusia iota* L., *Alcis repandata* L. and a varied series of *Erannis defoliaria* Clerck, one specimen having reduced scaling on all four wings. (6) From Bolton, Lancs.: *Arenostola pygmina* Haw. and *Cerapteryx graminis* L. (7) Examples of *Pieris napi* L. from Aviemore, Inverness-shire, the Outer Hebrides, Northern Ireland and Formby, Lancs. (8) From Waterford, Co. Waterford: *Cryphia muralis* Forst. (9) From Sussex: Bred series of *Euphyia luctuata* Schiff. and *Archiearis notha* Hb. (10) From Sheffield, *Oporinia filigrammaria* H.-S.

Mr. W. J. LE QUESNE—Miscellaneous insects from Majorca.

Brigadier C. G. LIPSCOMB—Series of aberrations of *Lysandra coridon* Poda captured in Wiltshire during 1954 and 1955; ♀ abs. *syngrapha* Kef. + *inframarginata* B. & L., *syngrapha* Kef., *semisyngrapha* Tutt, *infrasemisyngrapha* B. & L., *supraalbocrenata* B. & L. and *palidula* Tutt + *punctata* B. & L.; ♂ abs. *pulla* B. & L. + *suffusa* Tutt, *ultracaculio* B. & L. + *inframarginata* B. & L., *marginata* Tutt, *fowleri* South, *alba* B. & L. + *obsoleta* Tutt, *obsolescens* Tutt and *caeca* Courv.

Mr. G. E. L. MANLEY—*Hydraecia hucherardi* Mab. 4 males from Rye, Sussex; *Luperina testacea* Schiff. 3 forms; *Atethmia xerampelina* Esp. 4 red abs. and others from Hailsham, Sussex, district.

Mr. D. G. MARSH—Lepidoptera: Male *Mimas tiliae* L. with pink ground colour and deep burnt-sienna red band and red margins to hindwings (Ickham, Kent, 1955); three *Phragmatobia fuliginosa* L.: One typical, one ab. *borealis* Stdgr., and one ab. *fervida* Stdgr. (Ickham, 1955); *Tethea ocularis* L.: One typical, one ab. semi-melanic and one extreme melanic form (Ickham, 1955); *Apamea secalis* L. ab. *leucostigma* Esp., extreme black with white reniform mark (Ickham, 1955); two *Calophasia lunula* Hufn. (bred Dungeness, Kent, 1954); two minor varieties of *Euphyia luctuata* Schiff. (bred, Kent, 1954). A small number of aberrations bequeathed to Mr. Marsh by the late Wilfred Cope: *Argynnis euphrosyne* L., extreme underside variety—suffused; *A. selene* Schiff., variety silver straw colour; *Melitaea cinxia* L.—two fine undersides; *Aphantopus hyperantus* L. ab. *lanceolata* Shipp; *Lycaena phlaeas* L. ab. *radiata* Tutt; *Polyommatus icarus* Rott. ab. *radiata* Tutt (male); *Celastrina argiolus* L., gynandrous female; *Tethea* or Schiff., very fine var. with large yellow margins; *Cirrhia gilvago* Schiff., orange colour with indistinct markings.

Miss C. A. McDERMOTT—(1) A male *Erebia aethiops* Esp. bred 22.vii.55, from a female caught August 1954, in Strath Appin, Perthshire. (2) A female *Lysandra coridon* Poda third generation bred, 18.viii.55, from 2 females caught in Somerset.



Mr. ROBIN M. MERE—(1) *Plusia confusa* Steph. at mercury vapour lamp, 30.viii.55, Chiddingfold, Surrey. (Plate II, fig. 1). (2) *Lithophane lapidea* Hb. at mercury vapour lamp, October 1955, Isle of Wight. (3) *Celerio galii* Schiff. at mercury vapour lamp, 18.viii.55, Chiddingfold, Surrey, laid about 250 infertile ova. (4) *Apamea assimilis* Doubl. and *Eumichtis adusta* Esp. at mercury vapour lamp from over 4,000 feet on Braeriach, Cairngorms, 11.vii.55, and a *Colostygia didymata* L. from pupa found there that emerged 24.viii.55. (5) A series of *Diarsia festiva* Schiff. bred or taken from various localities in England and Scotland over the years to show variation.

Mr. J. L. MESSENGER—Lepidoptera:—2 *Harpyia bicuspis* Borkh. taken at Worth, Sussex, in June 1955; 4 *Odontosia carmelita* Esp. from Cotham, Surrey; 6 *Arctia caja* L. showing range of variation at Weybridge, Surrey; 6 *Dicycla oo* L. taken in Surrey, 1954-55, three of them approaching var. *renago* Haw. and three normal; 6 *Cucullia absinthii* L. from Weybridge, Surrey; *Hydraecia hucherardi* Mab. taken at Rye, Sussex, September 1955; a series of *Gypsitea leucographa* Schiff. bred from eggs laid by a female taken at Chiddingfold, Surrey, in March 1954; a series of *Jodia croceago* Schiff. also bred from eggs laid by a 1954 Chiddingfold female; a melanic female *Cleora rhomboidaria* Schiff. taken at E. Horsley, July 1954; a melanic male *Ematurga atomaria* L. taken at Chobham, Surrey, in July 1955; 5 *Scopula emutaria* Hb. from Wittering, Sussex; a specimen of *Palpita unionalis* Hb. taken at Weybridge, Surrey, in August 1955, and (jointly with Mr. R. F. BRETHERTON) a series bred from eggs laid by a female taken at Bordon, Hants, in August 1955; a series of 12 *Pyrausta (Anania) nubilalis* Hb. taken at Weybridge, Surrey, 1953-55; a melanic specimen of *Apatete megacephala* Schiff. with conspicuously dark hindwings taken at light at Weybridge, Surrey, 15th July 1955; a specimen of *Leucania pallens* L. showing melanic tendencies, taken at Weybridge, 27.vii.55; 2 melanic specimens of *Apamea ophiogramma* Esp. taken at light at Weybridge in July 1955.

Mr. H. N. MICHAELIS—(1) Lepidoptera found on the East Cheshire Moorlands (Gritstone) taken between altitudes of 1,000 and 1,600 feet, including: *Amathes glareosa* Esp., *Lithomoia solidaginis* Hb., *Hadena glauca* Hb., *Scopula ternata* Schrank (*fumata* Steph.), *Epirrhoë galiata* Schiff., *Xanthorhoë munitata* Hb., *Crambus margaritellus* Hb., *C. inquinatellus* Schiff., *Philedone gerningana* Schiff., *Peronea caledoniana* Steph., *P. mixtana* Hb., *Eucosma mercuriana* Hb., *Argyroploce sauciana* Hb., *A. mygindana* Schiff., *Bryotropha politella* Steph., *Borkhausenia similella* Hb., *B. subaquilea* Staint., *Elachista kilmunella* Staint., *Coleophora vitisella* Gregson, *Lithocolletis junoniella* Zell., *Argyresthia sorbiella* Treits. and *Ochsenheimeria bisontella* Zell. (2) Lepidoptera taken at Witherslack, Westmorland, in mid-July 1955. (3) *Stigmella weaveri* Staint. with mines in leaves of *Vaccinium vitis-idaea* L.

Messrs. W. E. MINNION and B. S. GOODBAN—(1) A series of *Xanthorhoë biriviata* Borkh. from southern England, first exhibited at the Society's meeting 11.viii.55. The species does not appear to have

been previously recorded from this country. The exhibit included examples of the summer form ab. *aestiva* Fuchs. (Plate II, fig. 10) and photographs of ova, larvae and pupae. (2) A series of *Gonodontis bidentata* Clerck bred from a male ab. *nigra* Prout from Yorkshire and a typical female from Bucks. The brood produced 30 typical examples with considerable variation, 17 ab. *nigra*, 3 ab. *fenestrata* Cockayne, 4 ab. *nigrofenestrata* Cockayne and 3 of a form with black abdomen and fringes as in *nigra* but with the wings of a buff colour with darker veins. This form may not as yet have been described. (3) Photographs of moths and larvae including a female *Hydraecia hucherardi* Mab., larvae of *Calophasia lunula* Hufn. and some experimental pictures taken at night in the open with the aid of Electronic flash apparatus.

Dr. B. P. MOORE—(1) A case of Carabidae (Coleoptera) collected at various localities in France by himself and Messrs. A. E. Gardner and F. T. Vallins. (2) A selection of West African Odonata collected by Mr. R. M. Gambles in Nigeria.

Mr. G. H. MORGAN—See J. F. D. FRAZER.

Mr. A. M. MORLEY—Lepidoptera taken during 1955 at Folkestone at mercury vapour light. (1) By A. M. Morley: *Notodonta tritophus* Schiff. (*phoebe* Sieb.) a male (22nd August); (Plate III, fig. 1); *Arctia caja* L. two males, without central spots on hindwings (28th July and 5th August); *Cryphia perla* Schiff. a very dark male (21st August), a heavily marked female (24th August) and a very small male (29th August); *Actebia praecox* L. a male (12th August); *Amathes c-nigrum* L. a female with the pale triangle on the costa reduced in size (22nd September) (Plate III, fig. 11); *Caradrina clavipalpis* Scop. a male, larger, paler and more strongly marked than usual (17th August). (2) By R. W. Fawthrop: *Herse convolvuli* L. a male, apparently newly emerged (22nd September); *Apamea monoglypha* Hufn. ab. *brunnea* Cockayne, a male and a female (July); *Crocallis elingvaria* L. ab. *brevipennis* Cockayne a male (30th July).

Rev. D. P. MURRAY—50 coloured drawings of S. African moths and Indian butterflies.

Mr. G. B. OLIVER—(1) *Argynnis paphia* L., a female example with typical upperside shade, the underside of the forewings having a prominent black patch from the costa to the centre of the wing, hindwings toned a violet-bronze. The silver bands similarly tinted (this specimen being the only aberration of note in this (F.4) brood, 1955). (2) A short series of *Euphydryas aurinia* Rott. showing some variation in the underside markings.

Mr. G. H. B. OLIVER—*Scopula imitaria* Hb., a specimen with broadly clouded forewing band (Plate III, fig. 5), and others approaching this form, bred Bucks, 1950.

Mr. R. E. PARSONS—*Colias fieldii* Mén. from the Khasia and Jaintia Hills, Assam, India, including a white form of the female, possibly unique; and two other varieties, one a male of a salmon colour, the other a female with the hindwing borders of an aberrant colour.

Mr. E. G. PHILP—See J. F. D. FRAZER.

Mr. N. B. POTTER—A series of aberrations taken during 1954 and 1955 in Hants., Wilts. and Dorset, including:—*Lycaena phlaeas* L. ♀ ab. *radiata* Tutt, The upperside forewings have only the discoidal and one basal spot present. All submedian spots absent, *Lysandra coridon* Poda ab. (? Gynandromorph), It looks like left side ♀, right side ♂ from the underside, also ♂ abs. *marginata* Tutt, *alba* B. & L., *antidigitata* B. & L., *postcaeca* B. & L., *semifowleri-margino* B. & L. and ♀ abs. *syngrapha-inframarginata* B. & L., *postcaeca* B. & L., *obsoleta* Tutt; *Aricia agestis* Schiff. ab. *radiata* Obth.; *Polyommatus icarus* Rott. ab. *costajuncta* Tutt and *Coenonympha pamphilus* L. ab. *antidex-transformis* Leeds.

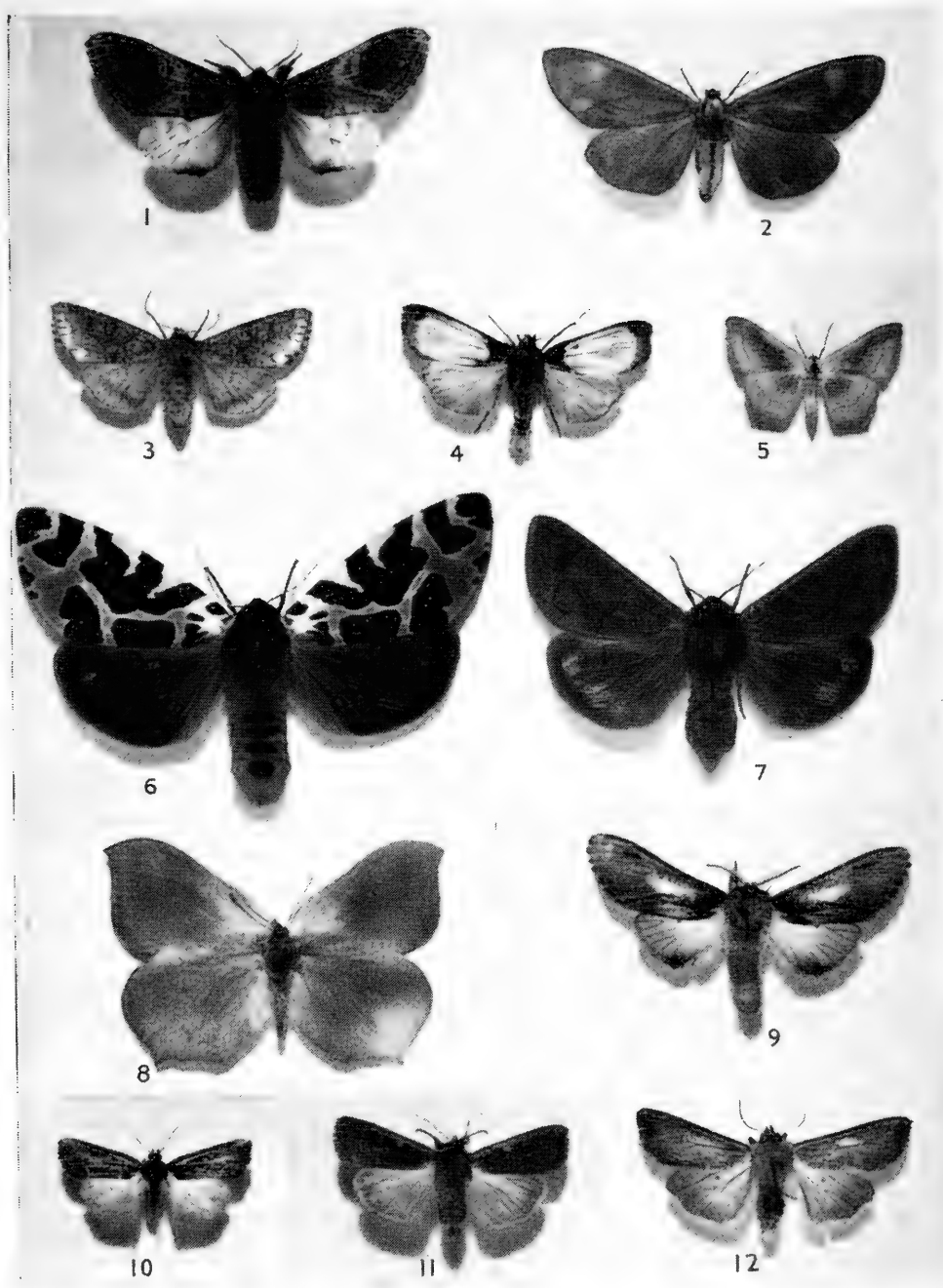
Mr. A. W. RICHARDS—(1) *Plusia ni* Hb. taken at Hawley, Hants., 25.vii.55. (2) Aberrations of *Biston betularia* L. taken at Hawley, 1955:—One ♀ *betularia* with dark markings, one ♂ with *insularia* Th.-Mg. forewings and *betularia* hindwings, one ♂ *insularia* with lighter hindwings and one ♂ *carbonaria* Jordan with lighter costal area of hindwings. (3) Two abs. of *Coenonympha pamphilus* L., one white ab. taken at Alice Holt Forest, 1955. (4) Two extreme *Aglais urticae* L. ab. *nigricaria* Haw. bred 1955, "the only two abs. bred out of many thousands bred". (5) Leaden coloured ab. of *Dasychira pudibunda* L. taken in Farnborough, Hants., 1955. (6) Five undersides of *Vanessa atalanta* L. bred among over 900 in 1955 in a greenhouse. "These have extended red bands, one in addition has almost black hindwings and one has the large white area of forewing replaced by blue".

Mr. AUSTIN RICHARDSON—Lepidoptera taken or bred, 1955:—Bred series of *Hydraecia hucherardi* Mab. with two preserved larvae, Sussex; bred series of *Calophasia lunula* Hufn. with two preserved larvae, Kent; *Spilosoma urticae* Esp., bred series with preserved larva, Suffolk; *Agrotis ripae* Hb., bred series with 2 varieties, light and dark, Kent; *Harpyia bicuspis* Borkh., bred series, Staffs.; *Amathes ditrapezium* Schiff., bred varied series, Caern.; *Sesia apiformis* Clerck, bred short series, Bucks.; *Odontesia carmelita* Esp., 16 taken at light, Glos., 30.iv.55; *Lophopteryx cucullina* Schiff., series from Bucks & Glos.; *Colocasia coryli* L. ab. *melanotica* Haverkamp, 5 Gen. I, Oxon. & 1

#### ANNUAL EXHIBITION, 29th October 1955.

1. *Notodonta tritophus* Schiff. Mr. A. M. Morley. 2. *Panaxia dominula* L. melanic ab. Mr. C. H. Dixon. 3. *Ceramica pisi* L. ab. Dr. Harold King. 4. *Diarsia brunnea* Schiff. ab. Dr. H. B. D. Kettlewell. 5. *Scopula imitaria* Hb. ab. Mr. G. H. B. Oliver. 6 and 7. *Arctia caja* L. abs. Mr. David Wright. 8. *Gonopteryx rhamni* L. melanic ab. Mr. H. J. Turner. 9. *Pheosia gnoma* Fab. extreme melanic ab. Mr. R. F. Bretherton. 10. *Cryphia divisa* Esp. Mr. J. R. Langmaid. 11. *Amathes c-nigrum* L. ab. Mr. A. M. Morley. 12. *Leucania unipuncta* Haw. melanic ab. Mr. J. R. Langmaid.

(NOTE.—All figures are reduced.)



*[Photos. W. H. T. Tams.]*



Gen. 2, Bucks.; *Dasypolia templi* Thunb., Caern.; *Chilodes maritima* Tausch., long series, Glos., where apparently variation is slight, new county record; *Agrotis denticulata* Haw., series from Forest of Dean, Glos., including three very dark specimens, 1 ♂ and 2 ♀; *Hadena lepida* Esp., 7 lightly marked abs. with white and yellow ground colour, Kent; *Amathes stigmatica* Hb., 3, Bucks.; *Procus versicolor* Borkh., long series, Bucks., with singles from Oxon. and Caern.; *Procus literosa* Haw. ab. *aethalodes* Richardson, two specimens, Yorks.; *Calophasia lunula* Hufn. ab. nov., with extended white areas outside the stigmata on forewings, bred Kent (Plate II, fig. 2). *Euphydryas aurinia* Rott., long series, Glos., including abs. with pale and dark bands on forewings and a specimen with defective scaling giving a slimy appearance; *Cleora cinctaria* Schiff., long bred series, Co. Kerry, including suffused abs. and several with antemedian and postmedian lines joined; *Gonodontis bidentata* Clerck ab. *nigra* Prout, series from Staffs. with two from Yorks. and one from Glos., new county record, also 1 ab. *fenestrata* Cockayne and 2 ab. *nigrofenestrata* Cockayne, bred with three typical specimens from a wild ab. *nigra* ♀, Staffs.; *Hydriomena furcata* Thunb., varied series of the bilberry form, Yorks.; *Sterrhia degeneraria* Hb., series, Dorset; *Heterogenea asella* Schiff., 16 taken at light, Bucks.; *Apatele leporina* L., 3 ab. *melanocephala* Mansbr., and 3 light specimens, Kent; *Apatele rumicis* L. ab. *salicis* Curt., 2 Staffs. and 2 Bucks.; *Apatele alni* L. ab. *steinerti* Caspari, Staffs., and a Gen. 2 ab. with broad dark borders to hindwing, Caern.; *Notodonta dromedarius* L. ab. *niger* Cockayne, short series from Yorks., Staffs. and Glos.; *Xylomiges conspicillaris* L., 3 typical ♂♂ and 1 ab. *intermedia* Tutt ♀, bred with 8 ab. *melaleuca* View. from a wild *intermedia* ♀, Glos.; *Orthosia gracilis* Schiff., 1 dark ab. and 1 with rayed postmedian line, Caern.; *Heliothis peltigera* Schiff., Caern.; *Enargia paleacea* Esp., 5 Yorks., including one approaching the dark Scottish form; *Leucania vitellina* Hb., 4, Devon; *Atethmia xerampelina* Esp., a yellowish ab., Caern.; *Plusia interrogationis* L., 1 Caern., 2 Yorks., 1 dark and 1 migrant specimen, Kent; *Plusia gamma* L., ab. with reduced Y, Caern.; *Antitype chi* L., a handsome specimen of ab. *olivacea* St. with marked white cross lines; *Agrotis vestigialis* Hufn., ab. with pale median and dark terminal area; *Tethea fluctuosa* Hb. ab. nov. with a dark antemedian band contrasting strongly with a rather pale median band, Glos.; *Apatele menyanthidis* View., ab. with brown postmedian cross line, Caern.; *Aethalura punctulata* Schiff. ab. *albescens* Tutt, Caern.; *Lygris testata* L., ♀ ab. with the usual pale antemedian band darkened, giving a uniform appearance to the basal area, Caern.; *Lophopteryx capucina* L., a dark ab., Kent; *Eupsilia transversa* Hufn., dark brown specimen, Glam.; *Cleora cinctaria* Schiff., 2 ab. *separata* Gordon Smith, Caern.; *Colotois pennaria* L., melanic ab., Glos.; *Abraxas grossulariata* L., lightly marked ab., Caern.; *Anaitis efformata* Guen. ab. *fimbriata* Cockayne, Glos.; *Palpita unionalis* Hb., Caern.; *Rhodometra sacraria* L., 2 specimens, Caern.; *Euphyia luctuata* Schiff., 2 abs. showing reduced and extended white areas on hindwing, Kent; *Celerio galii*

Schiff., a specimen taken at light, Kent, and a preserved larva, Glos.; *Eurois occulta* L., a grey migrant ♂, Glos., new county record: *Stauropus fagi* L. ab. *obscura* Rebel, specimen with pronounced white cross lines, Bucks.

Mr. CLAUDE F. RIVERS—(1) An exhibit of Insect Virus Research with which the exhibitor is associated. Photographs showing the characteristic appearance of insect larvae with nuclear and cytoplasmic polyhedral virus, and granulosis virus diseases. Photomicrographs of polyhedra as seen in smears and in tissue under the optical microscope. Electron-micrographs of the encapsulate viruses seen after hydrolysis and ultra-thin section cuttings.

Acknowledgments are due to the Agricultural Research Council under whose auspices this work is carried out. Electron-micrographs are by Miss S. Vernon-Smith, Cambridge.

(2) An exhibit of Lepidoptera comprising: (a) a series of hybrid Sphingidae bred by crossing a female *Laotboë populi* L. with a male *Smerinthus ocellata* L., including two halved gynandromorphs, both right side male, but one having spiral segmentation in the abdomen. (b) A gynandrous *Graellsia isabellae* Graells, (Saturnidae) ex pupa R. Agenjo, Madrid, May 1949. (c) Two male *Hydrillula palustris* Hb. (Caradrinidae) a new record for Holme Fen, Hunts. (d) *Panaxia dominula* L. (Arctiidae) an example of one of many crippled moths of this variety (*paradoxa* Reich.) which have been bred at the Virus Research Unit, Cambridge, during 1954 and 1955. (e) *Abraxus grossulariata* L. a somatic mosaic, bred ab ovo, Virus Research Unit, Cambridge, September 1954. (f) *Pontia daplidice* L. (Pieridae) male taken by the exhibitor near Ramsgate, Kent, August 1949.

(3) On behalf of Mr. BRIAN O. C. GARDINER of Cambridge. A selection of *Pieris brassicae* L. (Lep. Pieridae) bred from a continuous brooded stock, showing variations which have occurred, including an example of homoeosis (Plate II, fig. 5). Also some parasites and hyperparasites and the effect of a virus and bacterial disease.

Mr. F. RUMSEY—Lepidoptera: (1) *Saturnia pavonia* L. a gynandromorph and various aberrations obtained in the course of breeding from the following stock:—♀ reared from a larvae taken in Norfolk, August 1950, paired with a ♂ from Banstead, Surrey; offspring inbred and eventually producing a ♂ which was paired with a ♀ bred from a wild larva taken at Boxhill, Surrey, August 1954. The gynandromorph emerged 4.v.55. (2) *Heterographis oblitella* Zell. taken at mercury vapour light 15.ix.53, Norfolk.

Mr. A. D. A. RUSSWURM—*Hyloicus pinastri* L.; ten specimens taken at rest in the New Forest during July 1945. *Argynnis paphia* L. ab. *valesina* Esp.; two specimens showing upper and underside, New Forest, July 1945. *Lysandra coridon* Poda; eight males, four ab. *infra-marginata* B. & L., one ab. *laticornis* B. & L., one ab. *ultralavendula* B. & L. + *suffusa* Tutt, one ab. *alboradia* B. & L. (underside), one ab. *obsoleta* Tutt (underside), two females, one ab. *ultraalbocrenata* B. & L., extreme form with slate grey ground colour, one ab. *confluentiae*



Courv. (underside). All from Royston, Herts., August 1954 and 1955. *Pyrgus malvae* L., four specimens ab. *taras* Berg. Hants., May 1954. *Hesperia comma* L., one male, white markings on hind wings obsolete, one female, markings on hind wings enlarged to form irregular white band. Box Hill, August 1954. *Aphantopus hyperantus* L., two males, two females, ab. *arete* Müll. Two intermediate forms, Surrey. Two females ab. *crassipuncta* Burkhardt, New Forest, July 1953. One female ab. *lanceolata* Shipp., New Forest, July 1954. *Pararge megera* L., female with light ground colour, Oxfordshire, August 1954.

Mr. G. E. SCHMOLLE—See F. GOODLIFFE.

Dr. E. SCOTT—(1) A case of Microlepidoptera from the Nature Conservancy Wood at Ham Street, Kent. These are mostly common insects and show the richness of the area in tree feeding species. Coppicing is now under way and a change is expected in the pattern of species in a few years time as low growing plants increase. There is one rarity *Agrotera nemoralis* Scop. beaten from hornbeam 15.vi.54. (2) A case of *Tinaeina* from a garden on the Westwell Downs. Many have come to the house lights. (3) A specimen of *Schrunkia taenialis* Hb. (*albistrigalis* Haw.) taken at Westwell at a lighted window 22.vi.55.

Mr. S. GORDON SMITH—Series of aberrations of *Arctia caja* L. bred by David Wright and S. Gordon Smith, including abs. *brunnescens* Stattermayer, *fumosa* Horhammer and *wrighti* Gordon Smith.

Mr. W. H. SPREADBURY—Living fungi and lantern slides of wild flowers.

Mr. R. E. STOCKLEY—*Pararge aegeria* L., two melanic aberrations, male and female, having all wings heavily suffused, taken in a restricted locality in Surrey, September 1955 (Plate II, fig. 6).

Messrs. H. D. SWAIN and F. J. COULSON—(1) A collection of Coleoptera and Hemiptera taken during the Nature Conservancy survey of the Basingstoke Canal, between Frimley Green and Pirbright Bridge, Surrey, during 1954 and 1955. The specimens shown represent most of the species found in the area of the Basingstoke Canal proposed as a Nature Reserve. A sketch map was also shown indicating the sort of plant life found in the immediate vicinity. A feature worth recording is that many of the usually common species were far from common during the time occupied by the survey; this may have been due to the poor weather in 1954, and the early part of 1955. (2) A specimen of *Chiasmia clathrata* L. ab. *nigricans* Oberth.

Mr. H. SYMES—Specimens of *Nola albula* Schiff. bred from larvae found on Dewberry in S.E. Hants, 1953; also a pupa, a cocoon, and a partially constructed cocoon, a larval skin from which a parasite had emerged, and two parasites bred from larvae. All from the same locality.

Miss VERE TEMPLE—Water colour paintings, executed by the exhibitor from nature, illustrating the life histories of (1) *Arctia caja* L. (2) *Biston strataria* Hufn. and (3) *Thecla betulae* L.

Mr. D. W. THORPE-YOUNG—Series of *Eumenis semele* L., *Maniola*



*tithonus* L. and *Coenonympha pamphilus* L. comprising males and females of each species from various localities.

Rear Admiral A. D. TORLESSE—The following lepidoptera taken by the exhibitor at mercury vapour light during 1955:—(1) *Agrotis trux* Hb., a series taken on cliffs near Padstow, N. Cornwall 3rd-6th July. (2) *Hadena barrettii* Doubl., a short series, mostly worn, taken on cliffs near Padstow, 3rd-6th. July, showing considerable variation in size. (3) *Lymantria dispar* L., a specimen taken at Alverstoke, Hants, on 16th August. (4) *Cryphia impar* Warren, an unusual form taken at Alverstoke on 3rd August. (5) *Nonagria dissoluta* Treits., a series taken in South Hampshire, 21st-28th August, exhibiting a range of variation to ab. *arundineta* Schmidt. (6) *Ennomos autumnaria* Wernb., a short series taken at Alverstoke, 28th August-23rd September. (7) *Palpita unionalis* Hb., two taken at Alverstoke, 18th-19th August. (8) *Loxostege sticticalis* L., taken at Alverstoke, 18th August.

Mr. H. J. TURNER—Lepidoptera—A short series of *Celastrina argiolus* L. bred from the New Forest during 1954-1955 showing normal spring and summer broods including a male underside of ab. *obsoleta* Tutt. A number of male and female undersides of *Plebejus argus* L. showing variation in the spotting and many streaked aberrations including a female upperside ab. *partimtransformis* B. & L. and a female underside of ab. *obsoleta* Tutt (?), all taken in Dorset from 1953 to 1955, 34 specimens of *Plebejus argus* L. s.sp. *caernensis* Thompson taken in North Wales during 1953-1954, illustrating blue colouring in the female. A selected series of *Lysandra bellargus* Rott., taken in Wilts and Dorset from 1947 to 1954 including a male upperside ab. *atrescens* Tutt and a male of deep violet colouration, 13 male *obsoleta* Tutt, 4 ab. *caeca* B. & L., a male *alba-caeca* B. & L. and a *partimtransformis* B. & L., 3 female ab. *caeca* B. & L., and a female ab. *albescens-caeca* B. & L. A series of *Lysandra coridon* Poda from Wilts. and Dorset, 1951 to 1955, including five very unusually coloured males from Wilts., 4 male ab. *caeca* Courv., also abs. *striata* Tutt and *confluens* Tutt, 8 specimens of ab. *syngrapha* Keferstein and 4 ab. *semisyngrapha* Tutt, and a gynandrous female from Wilts., 1954. A series of bred specimens of *Euphydryas aurinia* Rott. from Dorset showing the many interesting forms bred over the period from 1951 to 1955, also 3 upperside and 2 underside abs. taken on the wing from the same locality. A series of ten specimens of *Argynnis selene* Schiff. from the New Forest all showing confluent hindwings, and one melanic specimen, all taken in the New Forest during 1954 and 1955. An underside male *Aphantopus hyperantus* L. from Wilts. of a very pale straw colour taken in 1955 on the open downs well away from its usual habitats. *Aglais urticae* L. a very pale straw underside, and an upperside with only one very faint central forewing spot showing. A bi-lateral gynandromorph *Hamearis lucina* L. bred 21.v.42, right side male, left female, previously recorded in our "Proceedings and Transactions", 1942-43, p. 36, and the "Entomologist", January 1943, p. 7,

but not shown (Plate II, fig. 8); gynandromorphism has never been recorded in this species before and the specimen shown is undoubtedly unique. A remarkable melanic *Gonepteryx rhamni* L. bred by M. Summers from a larva taken on the East Coast in 1920, previously in the collection of the late P. M. Bright of Bournemouth and Rev. J. N. Marcon of Eastbourne (Plate III, fig. 8). 3 aberrations of *Argynnis paphia* L. taken in the New Forest during 1941 and not previously shown: (1) a male ab. *confluens* Splr. (2) A very extreme male ab. *confluens*. (3) A very extreme female ab. *confluens* which is also ab. *valesina* Esp. with forewings heavily marked.

Mr. A. W. TYNAN—See J. F. D. FRAZER.

Mr. R. W. J. UFFEN—Larvae of *Pyrausta* (*Anania*) *nubilalis* Hb. in stems of *Artemisia vulgaris* L. from Chiswick, Middx., where they are common.

Mr. S. WAKELY—Numbers of lepidoptera taken during the current season including (a) From Byfleet, Surrey, taken from 15th July to 29th August chiefly at mercury vapour light: *Hyloicus pinastri* L., *Harpyia furcula* Clerck, *Stauropus fagi* L., *Pheosia tremula* Clerck, *P. gnoma* Fab., *Notodonta dromedarius* L., *Thyatira batis* L., *Tethea duplaris* L., *Drepna binaria* Hufn., *D. falcataria* L., *D. lacertinaria* L., *Mitochondria miniata* Forst., *Eilema griseola* Hb., *E. lurideola* Zinck., *E. complana* L., *Colocasia coryli* L., *Apatele leporina* L., *Cryphia perla* Schiff. (var.), *Agrotis vestigialis* Hufn., *Euxoa tritici* L., *Bombycia viminalis* Fab., *Apamea scolopacina* Esp., *Gortyna micacea* Esp., *Nonagria geminipuncta* Haw., *Coenobia rufa* Haw., *Leucania straminea* Treits., *Petilampa minima* Haw., *Dicycla oo* L., *Cirrhia icteritia* Hufn., *Polychrisia moneta* F., *Lygephila pastinum* Treits., *Laspeyria flexula* Schiff., *Parascotia fuliginaria* L., *Mysticoptera sexalata* Retz. (*sexalisata* Hb.), *Calocalpe undulata* L., *Xanthorhoë quadrifasciata* Clerck, *Hydrelia flammeolaria* Hufn., *Euchoeca nebulata* Scop., *Perizoma alchemillata* L., *Semiothisa notata* L., *Itame wauaria* L., *Deuteronomos erosaria* Schiff., *Apeira syringaria* L., *Epione repandaria* Hufn. (a series bred from ova), *Schoenobius forficellus* Thunb., *Nymphula stratiotata* L., *Dioryctria splendidella* H.-S., *D. abietella* Schiff., *Nephopterix similella* Zinck., *Crambus uliginosellus* Zell., *C. falsellus* Schiff., *Eulia formosana* Hb., *Polychrosis dubitana* Steph., *Hyponomeuta evonymella* L., *Gracillaria tringipennella* Zell. (b) From Camber and Rye, Sussex (July): *Leucoma salicis* L., *Spilosoma urticae* Esp., *Earias clorana* L., *Agrotis vestigialis* Hufn., *A. ripae* Hb., *Hama albicolon* Hb., *Leucania littoralis* Curt., *Eustrotia uncula* Clerck, *Semiothisa alternaria* Hb., *Schoenobius gigantellus* Schiff., *S. forficellus* Thunb., *Anerastia lotella* Hb., *Nephopterix genistella* Dup., *Platytes alpinellus* Hb., *Chilo phragmitellus* Hb., *Cacoecia aeriferana* H.-S., *Gypsonoma neglectana* Dup., *Bactra scirpicolana* Pierce, *B. furfurana* Haw., *Argyroploce bifasciana* Haw., *Eucosma semifuscana* Steph. (bred from larva), *Aristotelia pictella* Zell., *A. palustrella* Dougl., *A. lucidella* Steph., *Gelechia hippophaella* Schrank (bred from larva), *Phthorimaea marmorea* Haw., *Depressaria subpropinquella* Staint. (c) *Atolmis*

*rubricollis* L. (bred, Boxhill, Surrey), *Hadena contigua* Schiff. (bred, Horsley, Surrey), *Apamea ypsilon* Schiff. (bred, larva on black poplar, Camberwell, London), *Cirrhia gilvago* Schiff. and *Euphyia luctuata* Schiff. (bred, Ham Street, Kent), *Loxostege sticticalis* L. (Betchworth, Surrey), *Euzophera marmorea* Haw. (Dungeness, Kent), *Platyptilia ochrodactyla* Schiff. (Boxhill), *P. calodactyla* Hb. (bred, Ham Street); *Ancylis obtusana* Haw., *Lobesia permixtana* Hb., *Eucosma quadrana* Hb., and *E. rheediana* Haw. (Dunsfold, Surrey); *Laspeyresia gemmiferana* Treits. (bred, Luccombe, I.W.), *L. strobilella* L. (bred, Albury Park, Surrey), *Mompha schrankella* Hb. (Ham Street), *Blastobasis decolorella* Wo. (Dulwich, London), *Depressaria putridella* Schiff. (bred, Faversham Kent), *Elachista paludum* Frey. (bred, near Chilworth, Surrey), *Atemelia torquatella* Zell. (bred, Argyll, Scotland), *Ethmia terminella* Fletch. (Lydd, Kent), *Lithocolletis geniculella* Rag. (bred, Dulwich), *Gracillaria populetorum* Zell. (bred, Ockham, Surrey), *Ypsolophus lucellus* Fab. (bred, Chobham, Surrey), *Leucoptera lathrifoliella* Staint. (bred, Luccombe, I.W.).

Mr. NORMAN A. WATKINS—British Rhopalocera, 1955:—*Agapetes galathea* L. ♂ ab. *valentini* Williams, Somerset; *Aphantopus hyperantus* L. ♂ ab. similar to ab. *costatransformis* Leeds of *Maniola jurtina* L., Glos.; *Maniola jurtina* L. ♂ ab., a bleached and rayed form, Somerset; *Plebejus argus* L. ♂ ab. *transformis* B. & L., blue scales in centre of all wings very thin and buff-coloured, giving rayed and transparent appearance. Also a ♀ ab. *basijuncta* Tutt, Somerset, and 3 ♀ ♀ ab. *postradiata* B. & L., Dorset; *Lysandra coridon* Poda, a number of named aberrations including:—♂ uppersides *livida* B. & L. (1), *metallica* B. & L. (3), *marginata* Tutt (1), *ultrapunctata* B. & L. (1), and others; ♂ undersides *anticaeca* B. & L., *postcaeca* B. & L., *albescens* Ckll., *grisea* Tutt (?), *lunaextensa* B. & L., ♀ uppersides *syngrapha* Kef. (3), *metallica* B. & L. (1), *transformis* B. & L. (1), *roystonensis* Pickett (1), *transparens* Rebel + *metallica* (1); ♀ undersides *antiobsoleta* B. & L., *antidiscoelongata* B. & L. (2) (one extreme form). All Wilts. and Dorset. *Polyommatus icarus* Rott., Wilts. and N. Cornwall, ♂ abs. *obsoleta* Clark (2), *anti-albescens* B. & L. (1), *antitransiens-limbojuncta* B. & L. (1).

Mr. R. D. WEAL—(1) Coleoptera: A collection of 35 species of foreign Cerambycidae. (2) Lepidoptera: *Aglais urticae* L. an aberration taken at Allhallows, Kent, 18.ix.55, also *Dasychira pudibunda* L. an aberration from Epping Forest, Essex, 9.vi.45.

Mr. B. K. WEST—(1) Species of Rhopalocera recorded as having been seen migrating. NORTHERN RHODESIA: *Anaphaeis gidica* Godt. SOUTHERN RHODESIA: *Phalanta phalantha* Drury, *Vanessa cardui* L., *Eurytela dryope* Cr., *Catopsilia florella* F., *Mylothris chloris* F., r. *agathina* Cr., *M. poppea* Cr., r. *rueppelli* Koch., *Belenois zochalia* Bdv., *Glycestha aurota* F., *G. creona* Cr. f. *severina* Stoll., *Colias electa* L. and ♀ f. *aurivillius* Keferst., *Terias hecabe* L. w.s.f. *senegalensis* Bdv., d.s.f. *bisinuata* Btlr., f. *chalcemiaeta* Bltr. and f. *anjouana* Btlr., *Coeliades forestan* Cr. N.P.I. BAHAMAS: *Danaus plexippus* L., *Callidryas*

*agarithe* Bdv., *C. eubule* L., *Ascia monuste* L., *Eurema lisa* Bdv., *E. nicippe* Cr., *Eudamus proteus* L. TENNESSEE, U.S.A.: *Eurema lisa* Bdv. (2) An extreme aberration of *Colias hyale* L. taken at Langen am Arlberg, Austria, 18.viii.52.

Mr. L. S. WHICHER—(1) Three drawers of British *Aphodius* (Col. Scarabaeidae) representing 38 species and (2) Two cases of foreign *Aphodius* representing 106 species including paratypes of *A. goffi* Cartwright, *A. rossi* Cartwright, *A. sepultus* Cartwright, *A. brimleyi* Cartwright, and *A. geomysi* Cartwright.

Mr. A. J. WIGHTMAN (and see G. HAGGETT)—Short varied series of:—*Calophasia lunula* Hufn., Shoreham, Sussex; *Agrotis ripae* Hb., Hayling, Hants.; *Atethmia xerampelina* Esp., Pulborough, Sussex; *Cirrhia gilvago* Schiff., Findon, Sussex; *Antitype flavicincta* Schiff., Pulborough; *Hydraecia paludis* Tutt, Pulborough and Hayling; *H. oculate* L., Pulborough; *Diarsia rubi* View., Pulborough; *Gypsotea leucographa* Schiff., Arundel, Sussex; *Moma alpium* Osbeck, Hants.; *Cerapteryx graminis* L., Pulborough; *Apamea ypsilon* Schiff. (*fissipuncta* Haw.), Pulborough; *Hadena bicolorata* Hufn. (*serena* Schiff.) and 3 aberrant forms, Pulborough; *Euxoa tritici* L. and one obeliscalike example, Pulborough, and a single *Dicycla oo* L. from Chobham, Surrey.

Mr. G. F. C. WOOLLETT—Selections of:—(1) *Aphantopus hyperantus* L., all bred, including varieties of ab. *lanceolata* Shipp, Summer, 1955. (2) *Lysandra coridon* Poda, including abs. *fowleri* South, *punctata* Tutt and *cinnamomeus* B. & L., Surrey and Sussex, Summer, 1955. (3) *Colias croceus* Fourc., typical and ab. *helice* Hb., all bred, Summer, 1955.

The BARON DE WORMS—(1) A series of moths all taken in the Scottish Highlands (at Aviemore, Findhorn, Newtonmore and Kinlochewe) during August 1955. *Notodonta dromedarius* L., *Amathes agathina* Dup., *A. glareosa* Esp., *A. castanea* Esp., *A. depuncta* L., *Diarsia dahlia* Hb., *Apamea furva* Schiff., *Euxoa cursoria* Hufn., *Triphaena sobrina* Boisd., *Celaena leucostigma* Hb., *C. haworthii* Curt., *Antitype chi* L., *Aporophyla lutulenta* Schiff. ab. *sedii* Guer., *Hydraecia crinanensis* Burrows, *H. lucens* Freyer, *Lithomoia solidaginis* Hb., *Plusia bractea* Schiff., *Entephria flavicinctata* Hb. and *Dysstroma citrata* L. (2) A series of moths taken or bred from elsewhere in the British Isles during 1955: *Harpyia furcula* Clerck, from Surrey and the New Forest; *H. bifida* Brahm. from Ham Street, Kent; *Odontesia carmelita* Esp., from Surrey and Wilts.; *Eilema sororcula* Hufn., from Petworth, Sussex; *E. pygmaeola* Doubl., from Dungeness; *Chaonia ruficornis* Hufn., a pale form from Wilts.; *Moma alpium* Osbeck., from Ham Street; *Apatele alni* L., from Tilgate Forest, Sussex and Chiddingfold, Surrey; *Polyplocia ridens* Fab. from the New Forest; *Achlya flavicornis* L., a dark form from Sheffield; *Craniophora ligustri* Schiff., from Ipswich; *Amathes ditrapezium* Schiff., from Suffolk and Surrey; *Hadena albimacula* Borkh., from Dungeness; *H. capsophila* Dup., bred from Tramore, Ireland; *Anepia*

*irregularis* Hufn., bred from the Brecksand area; *Orthosia populeti* Fab., from Ham Street; *O. gracilis* Schiff., red form bred from the New Forest; *Dicycla oo* L., from Woking, Surrey; *Nonagria dissoluta* Treits., from Hants.; *Plusia pulchrina* Haw., from Tilgate Forest; *P. festucae* L., from Chester; *Hydriomena ruberata* Freyer, bred from Scotland; *Ectropis crepuscularia* Hb., dark form from Birmingham; *Dyscia fagaria* Thunb., from Horsell, Surrey. (3) Special exhibit: (a) a case containing a series of *Stauropus fagi* L., showing light and dark forms from S.E. England, June 1955. (b) *Lymantria monacha* L., with light and dark forms from the New Forest, July 1955. (c) *Hydraecia hucherardi* Mab., a series taken in S.E. Kent during September 1955. (d) Rare species and varieties of British Lepidoptera taken during 1955: *Harpyia bicuspidis* Borkh., from Tilgate Forest; *Dasychira pudibunda* L., a dark male from Surrey; *Agrotis ipsilon* Hufn. (*ypsilon* Rott.), an example with dark costa from Horsell; *Apatele aceris* L., an example with very dark forewings from Woking; *Mamestra brassicae* L., a melanic example from Surrey; *Bombycia viminalis* Fab., an example with variegated forewings from Ipswich; *Iuperina testacea* Schiff., a specimen with very dark and banded forewings from Dungeness and another with pale forewings and no bands, from Horsell; *Orthosia munda* Schiff., an example with the twin spots absent, Horsell; *O. incerta* Hufn., a specimen with pale ground and dark border from Surrey; *Nonagria neurica* Hb., two specimens from E. Suffolk; *N. typhae* Thunb., a female with deep brown forewings, Horsell; *Atethmia xerampelina* Esp. ab. *unicolor* Stdgr., a male from E. Kent; *Gortyna micacea* Esp., a very dark male from Aviemore; *Euphyia picata* Hb., a female from Bisley, Surrey; *Alsophila aescularia* Schiff., a melanic example from Horsell; *Angerona prunaria* L., a heavily banded specimen from Ham Street; *Gonodontis bidentata* Clerck, a melanic example from Cannock Chase; *Erannis marginaria* Fab., an extreme ab. *fuscata* Morley, from Sheffield; *Lycia hirtaria* Clerck, a very dark specimen from Horsell; *Alcis jubata* Thunb., an extreme banded form from the New Forest. (5) A series of 50 species of Butterflies taken near St. Martin Vésudie, in the Alpes Maritimes, France, in June and July 1955, including the following species:—*Papilio alexanor* Esp., *P. machaon* L., *Parnassius apollo* L., *P. mnemosyne* L., *Pieris manni* Meyer, *Pontia daplidice* L., *P. callidice* Esp., *Euchloë euphenoides* Stdgr., *Aporia crataegi* L., *Colias australis* Verity, *Gonepteryx cleopatra* L., *Argynnis aglaia* L., *A. niobe* L., *A. euphrosyne* L., *Brenthis amathusia* Esp., *Melitaea cinxia* L., *M. phoebe* Knoch., *M. athalia* Rott., *M. parthenie* Borkh., *M. varia* Oberth., *M. didyma* Ochs., including an example with white ground colour and another with white underside, *Euphydryas cynthia* Esp. with several melanic examples, *Pararge megera* L., *Agapetes galathea* L., *Satyrus circe* Fab., *S. cordula* Fab., *Oeneis aello* Hb., *Erebia ceto* Hb., *E. ligea* L., *E. euryale* Esp., *E. epiphron* Knoch., *E. evias* God., *E. stygne* Ochs., *E. tyndarus* Esp., *Coenonympha iphis* W.V., *U. arcania* L., *Lycaena alciphron* Rott., *L. virgaureae* L., *L. hippothoë*

*L.*, *Maculinea arion* L., *M.alcon* Schiff., *Meleageria meleager* Esp., *Agrodiaetus damon* Schiff., *Lysandra bellargus* Rott., *L. escheri* Hb., *L. hylas* Rott., *Cyaniris semiargus* Rott., *C. cyllarus* Rott. and *Plebejus argus* L.

Mr. DAVID WRIGHT—Aberrations of *Arctia caja* L. and a specimen of *Leucania loreyi* Dup. taken at mercury vapour light 28.ix.55, at Whitehall, Bordon, Hants. The *A. caja* L. F1 generation from a typically coloured wild female taken at mercury vapour light at Whitehall; F.2 comprising typical ab. *brunnescens* Stattermeyer and ab. *fumosa* Horhammer; F.3 being all ab. *fumosa* from a pairing ab. *fumosa* by ab. *fumosa*; F.4 being the same. Also F.1 ab. *brunnescens* from a pairing wild typical male with ab. *fumosa* (Plate III, figs. 6 & 7).

Mr. DAVID WRIGHT—See S. GORDON SMITH.

Mr. G. H. YODEN—(1) A series of *Gonodontis bidentata* Clerck black form bred from Manchester district 1955; another of *Odontesia carmelita* Esp. bred from Berkshire female 1955; and a series of *Apatele alni* L. bred from Surrey female 1955. (2) A long series of *Euphyia luctuata* Schiff. showing variation in colour from grey cross band to black, bred from S.E. Kent 1955. (3) Series of the following from S.E. Kent: *Hyponomeuta padella* L.; *Ethmia terminella* Fletch and 4 *E. bipunctella* Fab.; 3 *Eulia formosana* Geyer; one *Lithosia quadra* L. and one *Palpita unionalis* Hb., all from mercury vapour trap at Dover.

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10th NOVEMBER 1955.

The PRESIDENT in the Chair.

Mr. D. Wright was declared elected a member.

#### EXHIBIT.

Mr. W. H. SPREADBURY—The rear portions of empty but inflated skins of a Lepidopterous larva. These were representative of a large number that had fallen into his beating tray. They were thought to have been killed by a parasite.

#### COMMUNICATIONS.

BARON DE WORMS reported that on 6th November he had taken in a moth trap at Horsell, Surrey, a specimen of *Plusia acuta* Walker.

Mr. C. N. HAWKINS said that a Horse Chestnut tree near Hampton Court, Surrey, had bloomed a second time this year. Mr. SPREADBURY said he knew the tree. For many years it had bloomed a second time.

Mr. R. E. ELLISON reported that he had recently taken at Eastbourne, Sussex, two more examples of *Nycterosia obstipata* F.

Prof. G. C. VARLEY gave a talk on "The Ecology of Oak Insects". It was illustrated by the lantern, by diagrams and by several drawers of specimens.

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24th NOVEMBER 1955.

The PRESIDENT in the Chair.

Messrs. R. E. Stockley, J. Firmin, A. C. R. Redgrave, M. P. Gooseman, N. B. Potter and F. A. Noble were declared elected members.



The Secretary read the names of the members recommended by the Council to fill the various offices or to be Ordinary Members of Council for 1956-57.

#### EXHIBITS.

THE PRESIDENT—Coleoptera taken by Mr. F. T. Vallins in the Hautes Alpes, France, during August 1955. Species exhibited were:—*Romalorina gloriosa* F., *Exora lusitanica* L., *Cryptocephalus aureolus* Suff., *C. hypochoeridis* Suff., *Trichius abdominalis* Men., *Trichodes apiarius* L., *T. alvearius* F., *Lygistopterus sanguineus* L., *Rhizotrogus ater* F., *R. rufescens* Ratz. and ? *Protaeta (Potosia) cuprea* F.

Mr. W. E. MINNION—*Biston betularia* L., a series showing almost continuous variation from pale forms to extremely dark examples of *ab. carbonaria* Jord. illustrating the difficulty experienced in sorting typical *betularia*, *ab. insularia* Th.-Mg. and *carbonaria* Jord. into separate series.

Dr. B. P. MOORE—A bred adult of the Silphid beetle *Ablattaria laevigata* F. together with the larval exuviae.

Mr. J. L. HENDERSON—A male *Rantus exoletus* Forst. (Col., Dytiscidae) having the right antenna with the ninth joint long, the tenth and eleventh joints being merely indicated by sutures near the apex.

#### COMMUNICATIONS.

Mr. C. N. HAWKINS reported that the late Dr. K. G. BLAIR's collections had been allotted a room at the Red House Museum, Christchurch, Hants. He read a note giving full particulars.

Mr. D. LESTON discussed, with the aid of a graph, the months and the localities in which the aquatic Hemipteron *Gerris rufoscutellatus* Latr. had occurred.

There was a discussion, introduced by Dr. B. P. MOORE, on the Annual Exhibition of 29th October.

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8th DECEMBER 1955.

The PRESIDENT in the Chair.

The death of Mr. A. G. B. Russell, Clarenceux King of Arms, was announced.

Lt. Gerald Maitland-Smith was declared elected a member.

Mr. G. Stoughton-Harris was elected Member's Auditor.

The Secretary read the names of the members recommended by the Council to fill the various offices or to be Ordinary Members of Council for 1956-57.

#### EXHIBITS.

Mr. S. WAKELY—A specimen of *Aristotelia micrometra* Meyr. taken at mercury vapour light at Camber, Sussex, on 13th July 1955. The insect was first recorded by Mr. G. H. Heath in the *Entomologist* for

June 1935. He took two specimens at Braunton Burrows, N. Devon, on 2nd and 3rd July 1934. Other specimens were found to be in the British Museum under the name *Aristotelia servella* Zell., having been wrongly determined. These specimens, recorded in the *Ent. mon. Mag.* for 1894, came from King's Lynn, Norfolk. It is suggested that the larvae probably mine leaves of *Scirpus* in the spring. Also shown were two specimens of *Cacoecia aeriferana* H.-S. taken at the same place and date. This species was unknown in Britain until Dr. Scott found specimens coming to his light trap in 1951, and he has taken odd specimens each year since then.

**BARON DE WORMS**—*Plusia acuta* Walker, a native of Africa south of the Sahara, taken at light at Woking, Surrey, 5th November 1955.

#### COMMUNICATIONS.

It was reported that 43 examples of *Poecilocampa populi* L. had been noted at light on a single night in Kent recently.

**Mr. A. T. THOMPSON** showed a sound film on Locusts and exhibited living specimens of three species.

12th JANUARY 1956.

The **PRESIDENT** in the Chair.

**Mr. W. J. V. Ward**, B.A. (Cantab.), A.R.C.Sc., was declared elected a member.

The award of K.C.B. to Sir Robert Saundby was announced.

#### EXHIBITS.

**Mr. S. N. A. JACOBS**—The Pyralid moth *Cryptoses cholepi* Dyar, the Sloth moth, whose larva feeds on the alga growing on the fur of the South American Tree Sloth. It was mentioned by Dr. H. E. Hinton in his paper read before the Society on "Parasitic Lepidoptera".

**Dr. B. P. MOORE**—Examples of the British species of *Anthrenus* F. (Col., Dermestidae).

**Mr. A. E. GARDNER**—Odonata: a male *Agrion virgo* L. taken in June 1955, at Braunton, Devonshire, by Mr. R. D. Weal, in which the left hindwing has blue pigment developed around the costal area only. Hymenoptera: a male *Xylocopa violacea* L. taken at Trinquetaille, Provence, S. France, 20.ix.55.

**Mr. T. R. EAGLES**—(1) The curculionid beetle *Lixus algirus* L. found among imported bananas. (2) Galls found on the flowering shrub *Forsythia intermedia* Zabel. He said that he had been informed by Sir Edward Salisbury, Director of Royal Botanical Gardens, Kew, that there is some confusion as to the exact nature of these galls on *Forsythia*; the short lateral shoots rest for variable periods after their first flowering often becoming nodular at this stage. It is stated that in this state they are suitable for rooting. Apparently the basis of each nodule is an interrupted dome of tissue furnished jointly by all the external tissues and the wood forming cambium of the stem. Some authorities believe



these galls to represent adventitious root formation, and in fact true roots are formed directly from the nodule when placed near the ground or in water. Though it is not known whether bacteria are always the cause of abnormal growth in *Forsythia*, *Bacterium fascians* have been isolated from such galls.

#### COMMUNICATIONS.

Several members reported that reared imagines of *Euphyia luctuata* Schiff. had emerged in December and January although the pupae had been kept in cold conditions.

Lantern slides were shown by BARON DE WORMS, Mr. R. F. HAYNES and Mr. W. H. SPREADBURY.

28th JANUARY 1956.

#### 84th ANNUAL MEETING

(with which was combined the Ordinary Meeting).

Mr. F. D. BUCK, President, in the Chair.

The Minutes of the Annual Meeting held on 26th January 1955, were read and, after amendment, confirmed and signed.

The Treasurer, Mr. J. L. Henderson, presented his report and accounts and moved their adoption. Seconded by Mr. L. Parmenter and carried.

The Secretary, Mr. F. T. Vallins, read the Council's report and moved its adoption. Seconded by Mr. S. N. A. Jacobs and carried.

The President declared the following Officers and Ordinary Members of Council for 1956 elected:—*President*: Lt.-Col. W. B. L. Manley, F.R.E.S. *Vice-presidents*: F. D. Buck and B. P. Moore, B.Sc., D.Phil., F.R.E.S. *Treasurer*: J. L. Henderson. *Secretary*: F. T. Vallins, A.C.I.I., F.R.E.S. *Editor*: F. D. Buck. *Curator*: A. E. Gardner, F.R.E.S. *Librarian*: T. R. Eagles. *Lanternist*: L. Christie. *Council*: H. G. Denvil, F.Z.S., F.R.H.S., A. W. Gould, R. F. Haynes, S. N. A. Jacobs, S.B.St.J., F.R.E.S., R. M. Mere, F.R.E.S., Prof. O. W. Richards, M.A., D.Sc., F.R.E.S., W. H. Spreadbury, H. G. Tunstall, F. Stanley-Smith, C. G. M. de Worms, M.A., Ph.D., F.R.I.C., F.R.E.S., M.B.O.U.

Mrs. M. E. Manley, Mr. R. G. Chatelain, Wing Comdr. C. H. Schofield, Mr. T. J. G. Homer, M.A. Oxon., A.M.Inst.T., Capt. J. C. S. Marsh and Dr. J. V. Dacie, M.D., were declared elected members.

#### EXHIBITS.

Mr. F. RUMSEY—A fasciated bough of Sycamore (*Acer pseudoplatanus* L.) from a garden at Sutton, Surrey.

Mr. R. F. HAYNES—Two specimens of *Oporinia* bred from larvae beaten from birch in May, 1955, in the Glen Veigh Estate, north County Donegal, Ireland. One specimen appeared fairly typical but the other had a very pale straw-tinted ground colour and the hindwings were practically devoid of bands.

The President read his Address, which was illustrated by the lantern.

He then vacated the Chair and inducted the new President—Lt. Col. W. B. L. Manley, F.R.E.S.

Col. Manley thanked the members for the honour of electing him and moved a vote of thanks to Mr. Buck, coupled with a request for permission to publish his Address.

Carried by acclamation.

Mr. Buck replied and gave permission for his Address to be published by the Society.

A vote of thanks to the Vice-Presidents, Officers and Council was proposed by Mr. C. N. Hawkins, seconded by Mr. A. H. Sperring and carried.

Dr. B. P. Moore replied.

A vote of thanks to the Hon. Auditors was proposed by Mr. J. L. Henderson and carried.

Mr. F. Stanley-Smith replied.

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### PRESIDENT'S ADDRESS.

LADIES AND GENTLEMEN,

It is common knowledge that when engaged upon pleasurable tasks time passes much more quickly, and in fact it seems but a short time ago that I stood before you and accepted office from Mr. Jacobs. Yet much has occurred that is of great importance to our Society, as you heard from the Council's Report which Mr. Vallins has just read.

I doubt if anyone will disagree with my opinion that the most important event is the move to these quarters, which afford us accommodation for, and access to our collections and library that is of a very high standard indeed. The problem of our accommodation at this time last year was a heavy burden on the shoulders of your Council, and it was with considerable relief that they were able to come to terms with the Junior Institution of Engineers and secure the occupation of these rooms. The Council has acknowledged its debt to Mr. Gould in its report and I should like to add my personal appreciation.

Our Treasurer has once more proved to you that the financial affairs of the Society are sound, and with these in the capable hands of Mr. Henderson we can be sure that a strict eye will be kept on the income and expenditure with, I am sure, the happy results that he has so far achieved.

Though our membership has declined a little, it stands at under 500 for the first time since the year 1949-50 when it was 467, it is no cause for even the slightest pessimism and I confidently anticipate a rise to well above 500 during the coming year.

Whilst considering membership figures, the gains and the losses, one's mind inevitably turns to those good fellows we lost by death during the year. As stated in the Council's Report they number five in all.

The death of Mr. V. E. August was announced at the last Annual General Meeting. He joined the Society in 1936 and was elected to

membership at the same meeting as myself, though we did not sign the obligation book together. For some considerable time before he died Mr. August was very ill, though such was his fortitude that many of us were unaware of the seriousness of his illness.

Mr. H. W. Andrews died in April last, he joined the Society in 1907, was an active member until removing from the London area, and was appointed an Honorary Member in 1953. In 1927 he served as President and for a number of years acted as Treasurer of the *Entomologist's Record*.

Mr. S. G. Castle Russell first joined us in 1890 resigning in 1893, he rejoined however in 1915 and continued his membership until his death in June.

Mr. W. Mansbridge's death was announced in October, he had a continuous membership of 66 years being elected in 1889. In 1947 he was appointed a Special Life Member.

Mr. A. G. B. Russell was buried on the 6th of December, the Society being represented at the funeral by Dr. C. G. M. de Worms. He joined the Society in 1932 and in public life was the Clarenceux King of Arms.

We have stood in memory of each loss as they have been announced and I will not ask you to stand again.

Earlier this year, in the New Year's Honours List in fact, Her Majesty the Queen was graciously pleased to honour our member, Air Marshal Sir Robert Saundby, K.B.E., C.B., M.C., D.F.C., A.F.C., F.R.E.S., with a K.C.B. Sir Robert you will remember was our President in 1950.

You will have noted your Council's decision to withdraw support from the Nature Conservancy surveys due to the diminishing interest of the members. I believe this to be the one dim spot in our year's activities. In spite of the phenomenally good weather coupled with the opportunity to work some very interesting country at minimum personal expense, our activities in this field were below that of the previous year when the weather was little short of disastrous. It is somewhat surprising that a scheme commenced only two years ago, with such enthusiasm that our worthy secretary was unable to handle the correspondence involved, should fail in so short a time. I trust Mr. Swain's personal enthusiasm for active participation in the Society's administration has not been blunted in the process. Mr. Swain, in taking on the secretarial work connected with the surveys, has done an excellent job, and I would assure him that his efforts are greatly appreciated.

My grateful thanks are due to all the Honorary Officers and the Council for an easy passage through my year of office. Mr. Vallins, our secretary, in particular, the pivot on which our organisation turns, has taken the bulk of the work from my shoulders, smoothed the path and provided the steadying hand when I have tended to blunder. In particular does this apply to the negotiations connected with our removal to Rochester Row. Of Mr. Henderson I will only add, long may our finances rest in his capable hands.

This year Mr. Eagles, who has been our Hon. Editor for 11 years, has decided to relinquish this responsibility—a lesser man would have cried enough long ago. Never have things been so difficult for an editor of this Society as during the period Mr. Eagles has held this office, and it speaks volumes for his capability, tact and tenacity that he performed this exacting task so well. He must hold the South London in very high regard to have carried on so long—and he does not, of course, need to be told the high regard in which we hold him. I am particularly pleased that Mr. Eagles is not retiring entirely from taking an active part in the Society's management since he has permitted us to elect him as Hon. Librarian.

It is in his footsteps that you have elected me to follow. You have seldom elected a failure and I hope I do not let you down. Now the time has come to accept the responsibility the task, I feel, is enormous. No doubt I shall see it in a more reasonable light when Mr. Eagles has explained the ramifications—he has already assured me of all the help I need and for which I shall be most grateful.

Mr. Gardner remains an unobtrusive but hard working curator—saying little but working all the more. Our Lanternist, Mr Christie, comparatively new to the job, has accepted an office which I can assure you is no sinecure. He will, I am sure, make a great success of his office.

There are two officers seldom mentioned in the President's address in whose hands lie the success or failure of our meetings. I refer to the two assistant secretaries. The energy and drive of Mr. Howarth (Indoor Meetings) in this direction is truly amazing. I cannot say at the moment exactly how far ahead he is with the meeting arrangements but I do know that he is far enough advanced for us to view the matter with the utmost complacency. Mr. Wakely's efforts to promote field meetings are no less successful. Probably the person who realizes the efficiency of his work more than anybody, is the field meeting leader. Normally just as he decides that he must do something about train times, etc., along comes a note from the Assistant Secretary (Field Meetings) giving all the relevant details (plus something in addition) with a request to make such changes as is felt necessary and forward to the General Secretary for circulation. Personally I am only too pleased to send these details to Mr. Vallins intact. It would be nice to see Mr. Wakely's work acknowledged by a little larger attendances at the field meetings though. While these two gentlemen retain office we can be sure that our meeting activities will be well arranged.

For the entomological part of my address I must turn inevitably to the Coleoptera and trust I shall not bore you too much with the following paper, which I shall call—

#### **THE BRITISH MYCETOPHAGIDAE AND COLYDIIDAE.**

Three years ago I read a paper before this Society on the British Heteromera. It was known at that time that the paper was not complete, the Mycetophagidae and Colydiidae were omitted from this

sub-series as defined by Crowson (1953). The purpose of this present paper is to repair that omission.

### MYCETOPHAGIDAE.

Crowson first included these insects within the Heteromera. Prior to that time they were situated in the Clavicornia, usually close to the Dermestidae, some of which they superficially resemble. With no great variations this arrangement was used by Lecont & Horn (1883), Lameer (1901 and 1903), Ganglebauer (1903), Sharp & Muir (1912), and Leng (1920). Kolbe's work (Verg. morph. untere am Kol., *Arch. f. Naturg. Beiheft*, 1901) has not been available for reference but Ganglebauer (1903) shows that he places the Mycetophagidae in a large and ungainly group equivalent to a family series which he calls Heterorrhaden. This takes in amongst others, Malacodermata, Sternoxia, Clavicornia and Heteromera, and widely separates the family under discussion from the Heteromera.

Crowson distinguishes the Mycetophagidae from the rest of the Heteromera as follows:—

Adult: tarsi 3-4-4 segmented in male, (4-4-4 in female), penultimate segment never bilobed; mes-epimera reaching middle coxal cavities (fig. 1); antennal insertions not concealed by expanded edges of front of head; antennal club usually 4-5 segmented; front coxae somewhat protuberant, not projecting, without lateral concealed extension inside prothorax (fig. 3); wings nearly always with a sub-cubital fleck (fig. 7); apical segment of maxillary palpi not or seldom securiform. Larvae: hypopharynx evidently sclerotised, mandibles asymmetrical.

It is unfortunate from the point of view of the above definition that all the British genera, except *Mycetophagus* itself have distinct 3-segmented clubs; and some of the *Mycetophagus* have a club difficult to define.

The family can be divided into two tribes, the Mycetophagini and the Esarcini, which according to Ganglebauer (1899) are recognisable by the very transverse hind coxae of the former, which almost reach the side margin, and their deep metasternum; against the moderately transverse hind coxae of the latter, which reach little more than half way to the side margin, and by their narrow metasternum. The Esarcini, which contain mainly aberrant forms of Mycetophagidae, have no British representatives.

British species of Mycetophagidae can in fact be readily separated from most of the Heteromera on the tarsal characters alone. All our Heteromera (except the Colydiidae) have the tarsi 5-5-4 segmented and none of our Mycetophagidae conform to this formula. The Colydiidae are most easily separated by the mes-epimera which does not reach the middle coxal cavities (fig. 2). Superficially the Mycetophagidae can only be confused with the Tetratomidae and some of the smaller Melandryidae. They are of a distinctive general fascies (fig. 35), more or less pubescent and usually clearly patterned.

The wing venation of the Mycetophagidae (fig. 7) differs from that

of the Tetratomidae (fig. 8) by having what appears to be a spur on the cross vein RM. This however cannot be considered a true spur, lying as it does obliquely to the vein, as compared with the true spur which is almost at right angles; it is most probably a coalescence of the infusate area which appears in this position in a number of beetles particularly *Tetratoma fungorum* F. (fig. 8).

The met-endosternite shows a very great affinity between the Mycetophagidae and the Tetratomidae. Crowson (1938) figures the met-endosternite of *Mycetophagus quadripustulatus* (L.) with very flat and widely spaced arms—almost T-shaped in fact, whereas my own preparation (fig. 12) shows it to be much more Y-shaped. Crowson agrees (*in litt.*) that the preparation from which he drew his figure, a balsam mount, could have been somewhat tilted. Comparing this with that of *Tetratoma fungorum* F. (fig. 14) and with *Triphyllus bicolor* (F.) (fig. 13) in support, the angles of the arms are almost identical, the tendons arise from the same position on these arms and the laminae are little different: the stem, however, is somewhat stouter in *Tetratoma*.

The aedeagus of *Mycetophagus* (fig. 20) is more typically Heteromeroid than *Tetratoma* (fig. 21), which has the medial lobe enveloped in the lateral lobes. In this respect the Mycetophagidae approach more closely the Anthicidae (fig. 22) in having small lateral lobes with the basal piece reduced to a narrow stalk.

Our species are primarily fungicolous, the imagines and larvae in all stages being frequently encountered in the same piece of fungus. Some species, particularly *Mycetophagus quadripustulatus* (L.) and *Triphyllus bicolor* (F.) are on occasions found in the burrows of *Scolytus scolytus* (F.) once the fungus has obtained a hold. *Litargus* is normally taken under bark and *Typhaea* in vegetable refuse where both are most likely feeding on fungoid growth.

The larvae (fig. 34) are of a characteristic form, fairly heavily chitinated, with each segment bearing a plate on the dorsal side, legs rather elongate, and the apical segment of the abdomen furnished with two horns.

#### KEY TO GENERA.

1. Antennae with a distinct three-segmented club (fig. 27) ..... 2  
    Antennae if with a distinct club it is more than three-segmented  
    (figs. 28, 29, 30) ..... *Mycetophagus*
2. Pubescence on elytra set in longitudinal rows, best seen with light  
    coming from in front ..... *Typhaea*  
    Pubescence on elytra not set in longitudinal rows ..... 3
3. Base of pronotum narrower than elytra at the shoulders; basal  
    angles obtuse or rounded (fig. 31) ..... 4  
    Base of pronotum as wide as elytra at shoulders; basal angles sharp,  
    right angled (fig. 32) ..... *Litargus*
4. Very strongly and diffusely punctured, with long, semi-erect  
    pubescence; base of pronotum bisinuate ..... *Triphyllus*

Moderately strongly and closely punctured; pubescence shorter and recumbent; base of pronotum almost straight *Pseudotriphyllus*

#### KEY TO SPECIES.

##### MYCETOPHAGUS.

1. Antennae with a four-segmented club, segment seven distinctly narrower than eight (fig. 30) ..... 2  
Antennae indistinctly clubbed, segment seven very little, if at all, narrower than eight (figs. 28, 29) ..... 3
2. Pronotum strongly and closely punctured, sides crenulate anteriorly; elytra rugosely punctured between striae; with moderately long, semi-erect pubescence (3-3½ mm.) ... *quadriguttatus* Muell.  
Pronotum and elytra between striae with fine ground sculpture; sides of pronotum simple; pubescence fine and short, recumbent (3-4 mm.) ..... *populi* F.
3. Pronotum broadest at base, sides simple ..... 4  
Pronotum broadest at middle, sides crenulate (3¾-4¼ mm.) ..... *multipunctatus* F.
4. Segment seven of antennae distinctly transverse; humeral testaceous mark reaching the suture (3½-4½ mm.) ..... *piceus* (F.)  
Segment seven of antennae quadrate or only slightly transverse; humeral marks well separated at the suture ..... 5
5. Antennae with apical segments much more transverse (fig. 29), elytra normally with four testaceous maculae (5-6 mm.) ..... *quadripustulatus* (L.)  
Antennae with apical segments much less transverse (fig. 28), elytra with two humeral and two apical maculae, two sub-apical fascia and several smaller marks (3½-4½ mm.) ..... *atomarius* (F.)

##### TYPHAEA.

Unicolorous rufus or castaneous, strongly pubescent, and elytra distinctly seriate-punctate (2½-3 mm.) ..... *stercorea* (L.)

##### LITARGUS.

1. Elytra elongate, more than twice as long as wide, parallel sided, black; sides of pronotum and elytra testaceous with a humeral and sutural spot, and a sub-median fascia, testaceous (2½-3 mm.) ..... *bifasciatus* (Geof.)  
Elytra less elongate, scarcely twice as long as broad, sides arcuately rounded, piceus with similar but less distinct marking (2½-3 mm.) ..... *balteatus* Say. = *coloratus* auct.

##### TRIPHYLLUS.

Head and pronotum testaceous, elytra black to pitchy with base testaceous, strongly and confusedly punctured (3-4 mm.) ..... *bicolor* (F.)

##### PSEUDOTRIPHYLLUS.

Rufous to piceus, closely, moderately strongly and confusedly punctate (2¼-3 mm.) ..... *suturalis* (F.)



## COLYDIIDAE.

This family also was first included in the Heteromera by Crowson, though in the past there has been confusion between some species of the Tenebrionidae and this family, and vice versa. All the authors mentioned in the remarks on the Mycetophagidae (page 54) include the Colydiidae in the Clavicornia or its equivalent. Kolbe places Colydiidae in the same family series as he does Mycetophagidae, and in consequence the same remarks made when dealing with that family also apply here. Crowson gives the following as family characters:—

Adult: tarsal formula 4-4-4 (very rarely 3-3-3) in both sexes; antennae more or less clubbed and insertions usually hidden under side margin of head; penultimate tarsal segment never bilobed; wings nearly always with a sub-cubital fleck (fig. 10); apical segment of maxillary palpi not or slightly securiform; front coxae not at all projecting above the level of the prosternum, with hidden lateral extensions (fig. 4). Larvae: hypopharyngeal sclerotisation indistinct or absent; mandibles symmetrical.

The Colydiidae, along with the Mycetophagidae are separated readily from the rest of the British Heteromera by the tarsal formula. The differences between these two families are given on page 54.

Crowson tentatively divides the family into five groups, first he splits off those genera with exposed antennal insertions, closed front coxal cavities and trochanters scarcely visible from above. This group contains only our *Teredus* and *Oxylaemus*. From the remainder he separates *Aulonium* and *Colydium* by their closed anterior coxal cavities, 11-segmented antennae with a three-segmented club, and strongly heteromeroid trochanters; then *Myrmecixenus* by its four-segmented antennal club. The remaining two groups are:—Those with fully closed anterior coxal cavities, more strongly heteromeroid trochanters and a more distinctly hylecoetoid met-endosternite; and, those with imperfectly closed anterior coxal cavities, weakly heteromeroid trochanters and with the met-endosternite hardly distinguishable as hylecoetoid.

These last two groupings break down on the coxal cavities alone, they cannot be separated on this character because none of our Colydiidae, which he has not previously separated, have closed anterior coxal cavities. *Bitoma*, which Crowson places in the former group, has the anterior coxal cavities partially open (fig. 5). Some, it is agreed, are more widely open than others (fig. 16). The met-endosternite too seems to have little value in this instance, that of *Bitoma* (fig. 15) when compared with *Aulonium* and *Colydium* (figs. 17 and 18) is almost as far removed from typical hylecoetoid as *Orthocerus* (fig. 16) which he places in the latter group. *Synchita* and *Cicones* have also been examined and confirm this.

Pope, in discussion, tells me he considers the family divide into two sub-families, the Colydiinae and the Bothriderinae, the former having the antennal insertions hidden in the manner of the Tenebrionidae and the latter having them exposed as in the first group of Crowson.



He considers the arrangement of tribes should follow in the main the classification of Ganglebauer (1899).

A comparison of the wing venation with *Hypophloeus* (fig. 9), to which some have a great superficial resemblance, and a similar habitat, shows a difference in the sub-cubital fleck, the radial sector, the cross vein and the anal cell and veins. The sub-cubital fleck is present in most Colydiidae (fig. 10) and absent from *Hypophloeus*, the radial sector also is present in Colydiidae and incomplete in *Hypophloeus*. Though weak, the cross vein is present in Colydiidae but completely wanting in *Hypophloeus*. The structure of the anal cell and anal veins is best compared with the aid of the figures—perhaps the most striking point here is the incomplete formation of the anal cell in Colydiidae. It is noticeable that there is in both a large strongly sclerotised area where often in the Heteromera it is only infuscate. However if the wing is compared with *Gnathocerus* (fig. 11) which is at present placed in the Ulominae along with *Hypophloeus*, the points of difference are far fewer. First the radial sector, though more complete than *Hypophloeus*, is still not as complete as in the Colydiidae; second, the cubital fleck is absent; and finally, the sclerotised area apical to the radial sector is weaker in *Gnathocerus* and incidentally lies in a more medial position.

In this family the met-endosternite is very variable but falls into two main groups:—(1) those with long slender stems and arms, and well developed laminae (figs. 17 and 18); and (2) those with short wide stems, short stubby arms and weakly developed laminae (figs. 15 and 16). The former in some instances (fig. 17) are only distinguishable from the Mycetophagidae (figs. 12 and 13) by the more prominent laminae, though others (fig. 18) are developed more in the direction of *Hypophloeus* (fig. 19) in the shape of the stem and the slenderness of the arms, but in the case of *Hypophloeus* the laminae are extremely weak. It may be worth noting here that a narrow stem to the met-endosternite may not in all cases denote approximate intermediate coxae; such an exception is *Hypophloeus unicolor* (Pill. & Mitt.).

The aedeagus (figs. 23 and 24) appears to have a greater affinity to *Tetratoma* (fig. 21) than *Hypophloeus* (fig. 26), though *Gnathocerus* (fig. 25), as in the case of the wing venation, has a similar structure.

Colydiidae in Great Britain are mainly found under bark of trees (*Aulonium*, *Bitoma*, *Cicones*, etc.) where they are predaceous on other sub-cortical insects; others are found in refuse, mainly vegetable, where it is most likely they are also predaceous. In one instance, *Myrmechixenus subterraneus* Chev., the habitat is in the nests of ants.

The larvae in a number of instances are unknown as far as the author is aware. However, the larvae of *Aulonium* (fig. 33) is fairly typical of the sub-cortical species and have the apical segment heavily sclerotised (more so than the head) and has a pair of short spines.

#### KEY TO GENERA.

1. Antennal insertions hidden by side margin of head so that base of segment one is not visible from above ..... 2

- Antennal insertions not hidden by side margin of head, base of segment one entirely visible from above ..... 11
2. Antennae stout and spindle-shaped with long outstanding setae, segment two transverse ..... *Orthocerus*  
Antennae abruptly clavate or gradually widening to the apex ... 3
3. Pronotum broadly transverse, with wide explanate side margins which are uneven or crenulate and with scales ..... 4  
Pronotum if transverse not widely explanate at sides ..... 5
4. Head with very strong prominences in front of eyes and above insertions of antennae, elytra with a number of raised areas ... *Endophloeus*  
Head without prominences and elytra simple ..... *Cicones*
5. Antennae evenly widened anteriorly ..... *Myrmecixenus*  
Antennae with a distinct club ..... 6
6. Eyes absent, antennae with a loose 3-segmented club ..... *Aglenus*  
Eyes present, antennae with a differently formed club ..... 7
7. Pronotum with raised ridges extending the entire length, anterior angles produced ..... 8  
Pronotum without ridges extending the entire length and without produced anterior angles ..... 9
8. Pronotum with three ridges which are continued on to elytra ..... *Langelandia*  
Pronotum with four ridges, elytra simple ..... *Bitoma*
9. Elytra with a row of scales on each interstice, pronotum rugose and very dull ..... *Synchita*  
Elytra simple, if pronotum dull it is due to reticulation ..... 10
10. Alternate interstices of elytra raised and convex, head slightly contracted in front of eyes, clypeal suture straight, pronotal channel narrow ..... *Colydium*  
All elytral interstices flat, head strongly contracted in front of eyes, clypeal suture arcuate, pronotal channel broad and widened basally ..... *Aulonium*
11. Eyes absent, tarsi 3-segmented ..... *Anommatus*  
Eyes present, tarsi 4-segmented ..... 12
12. Pronotum strongly raised in the centre of the base where there are two very deep foveae and on each side of these is a sulcus, deep and broad at the base and evanescent apically; external margin of tibiae dentate ..... *Oxylaemus*  
Pronotum not raised in the centre of the base, without foveae or sulci; external margin of tibiae simple ..... *Teredus*

### KEY TO SPECIES.

#### AGLENUS.

Testaceous, shining, moderately strongly and diffusely punctured, antennae with a weak 3-segmented club. In refuse (1.5-2 mm.) ..... *brunneus* Gyll.

## COLYDIUM.

Black, appendages testaceous to piceus, elongate, parallel sided, head and pronotum finely and diffusely punctured, finely reticulate between punctures, elytral striae strongly but diffusely punctured. Under bark, usually in burrows of bark beetles (4-6 mm.) ..... *elongatum* F.

## AULONIUM.

1. Clypeal margin strongly emarginate, anterior part of head and pronotum simple, elytral striae more strongly punctured than interstices. Under elm bark in the burrows of *Scolytus multistriatus* (Marsh) (4.5-7 mm.) ..... *trisulcum* Geof.

Clypeal margin fully emarginate, anterior part of head with a pair of tubercles, anterior part of pronotum also with a pair of tubercles, elytral striae slightly more punctured than interstices. Under pine bark in the burrows of *Onthotomicus laricis* (F.) (3.5-4 mm.) ..... *ruficorne* Ol.

## TEREDUS.

Black, appendages testaceous; elongate, parallel sided; head and pronotum diffusely punctured; strongly reticulate; elytra striate-punctate, obsolete on disc; interstices reticulate. Under bark (3.5-4 mm.) ..... *cylindricus* Ol.

## OXYLAEMUS.

1. Pronotal sulci reaching middle of pronotum; testaceous; puncturation very strong and coarse; outermost striae of elytra as strongly punctured as the rest. Under bark (3.5-4 mm.) ..... *variolosus* Duft.

Pronotal sulci not extending beyond basal third of the pronotum; puncturation less strong and coarse, especially on elytral striae; outermost striae of elytra represented by fine punctures. Under bark (3 mm.) ..... *cylindricus* Panz.

## ORTHOCERUS.

Black, dull; with ashen scales and curved setae, particularly noticeable on sides and on legs; head and pronotum with uneven raised areas, elytra with alternate interstices raised. At roots of grass in sandy situations (4-5 mm.) ..... *clavicornis* Er.

## ENDOPHLOEUS.

Piceus, with coarse grey scales, tuberculate with uneven raised areas, sides of pronotum unevenly dentate, sides of elytra crenulate. Under bark (2.75-3.25 mm.) ... *markovichianus* Pill.

## BITOMA.

Black, appendages piceus, elytra with four reddish maculae (two humeral and two apical), head and pronotum rugosely punctured, elytra striate-punctate with alternate interstices raised. Under bark (2.75-3.25 mm.) ..... *crenata* (F.)

## SYNCHITA.

Piceus, appendages lighter, head and pronotum rugosely punctured, the sides of the latter crenulate, elytra striate-punctate with raised scales on interstices. Under bark (2.75-3.5 mm.) ..... *humeralis* F.

## CICONES.

Piceus, anterior part of head and marks on elytra lighter, head and pronotum tuberculate with uneven raised areas, elytra coarsely seriate-punctate with grey curved scales in patches. Under bark of beech and hornbeam (2.75-3.5 mm.) ..... *variegatus* Hell.

## MYRMECHIXENUS.

1. Pronotum more abruptly contracted to base and shining. In nests of *Formica rufa* L. (1.25-1.75 mm.) ..... *subterraneus* Chev.
- Pronotum more parallel-sided, somewhat dull. In both animal and vegetable refuse (1.75-2 mm.) ..... *vaporariorum* Guer.

## LANGELANDIA.

Parallel-sided; testaceous, head and part of pronotum sometimes darker, dull, sides of pronotum and elytra crenulate. In decaying potatoes underground (2.5-3.5 mm.) ..... *anophthalma* Aube

## ANOMMATUS.

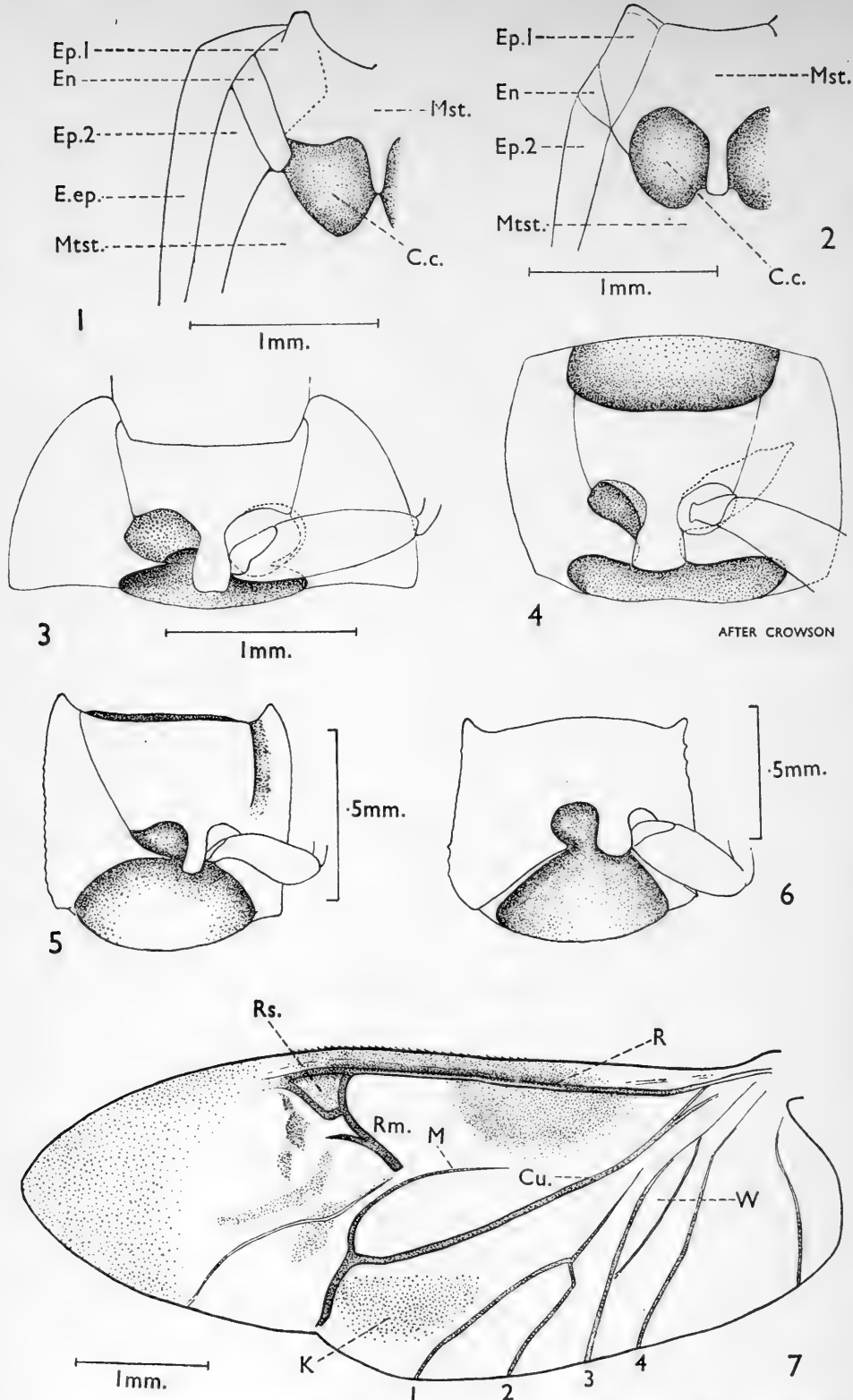
Testaceous, sides of pronotum widened anteriorly, sides of elytra slightly rounded, puncturation coarse and diffuse. In rotting vegetable refuse (1.5-1.75 mm.) ..... *duodecimstriatus* Mull.

## ACKNOWLEDGMENTS.

My thanks are due to Dr. F. van Emden who supplied larvae for my examination and to Mr. R. A. Crowson for permission to use the figure of the prosternum of *Myrmecchixenus vaporariorum* from his work on the Classification of British Coleoptera.

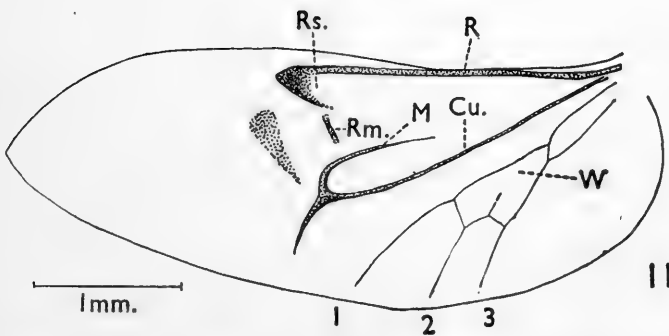
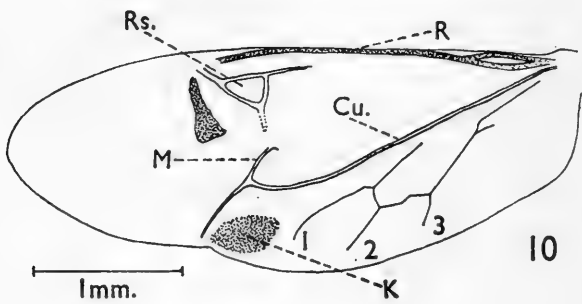
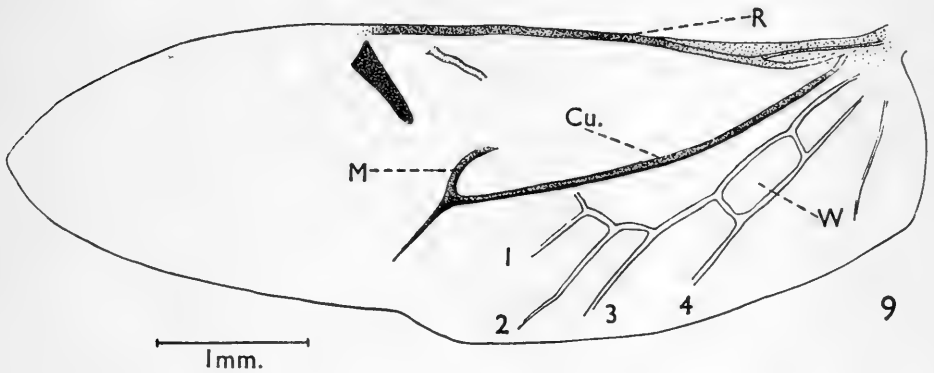
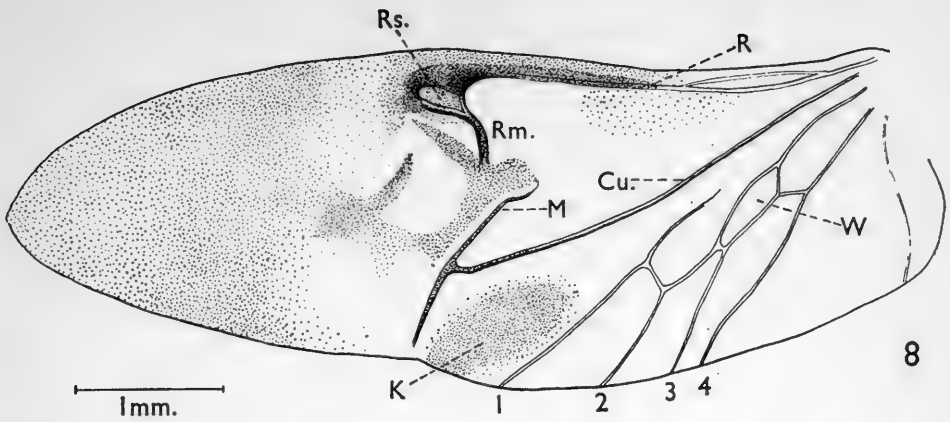
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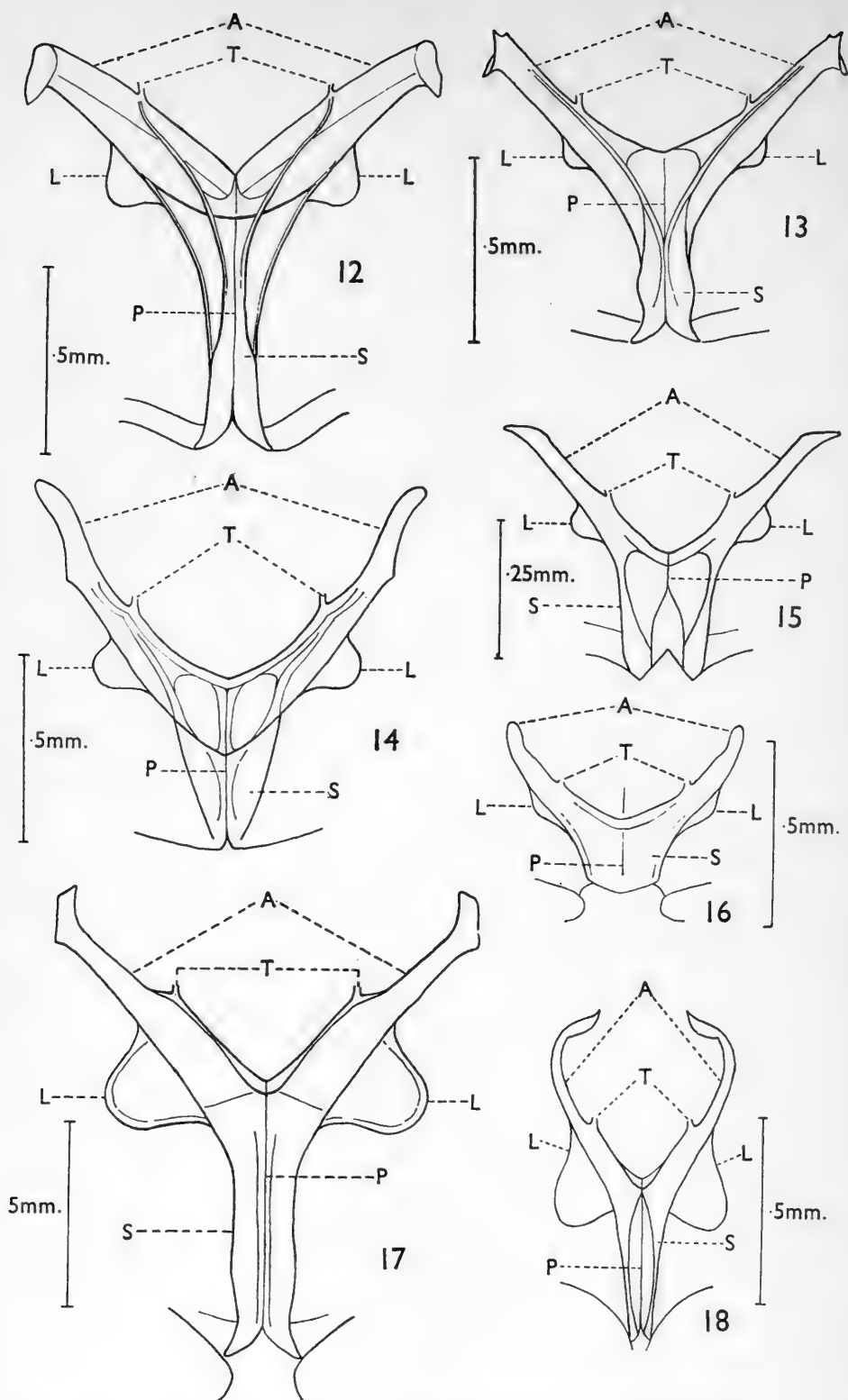
FIGS. 1-7. 1. Right intermediate coxal cavity and mes-epimera of *Mycetophagus quadripustulatus* (L.). 2. The same, *Aulonium trisulcum* Geof. 3. Prosternum of *Mycetophagus quadripustulatus* (L.). 4. The same, *Myrmecixenus vaporariorum* Guer. 5. The same, *Bitoma crenata* (F.). 6. The same, *Orthocerus clavicornis* Er. 7. Wing of *Mycetophagus quadripustulatus* (L.).

C.c., coxal cavity. Cu., Cubitus. E. ep., elytral epipleura. En., Mes-epimera. Ep. 1, Mes-episternum. Ep. 2, Met-episternum. K., sub-cubital fleck. M., media. Mst., mesosternum. Mstst., metasternum. R., radius. Rm., cross vein. Rs., radial sector. W., anal cell. 1-4, anal veins.



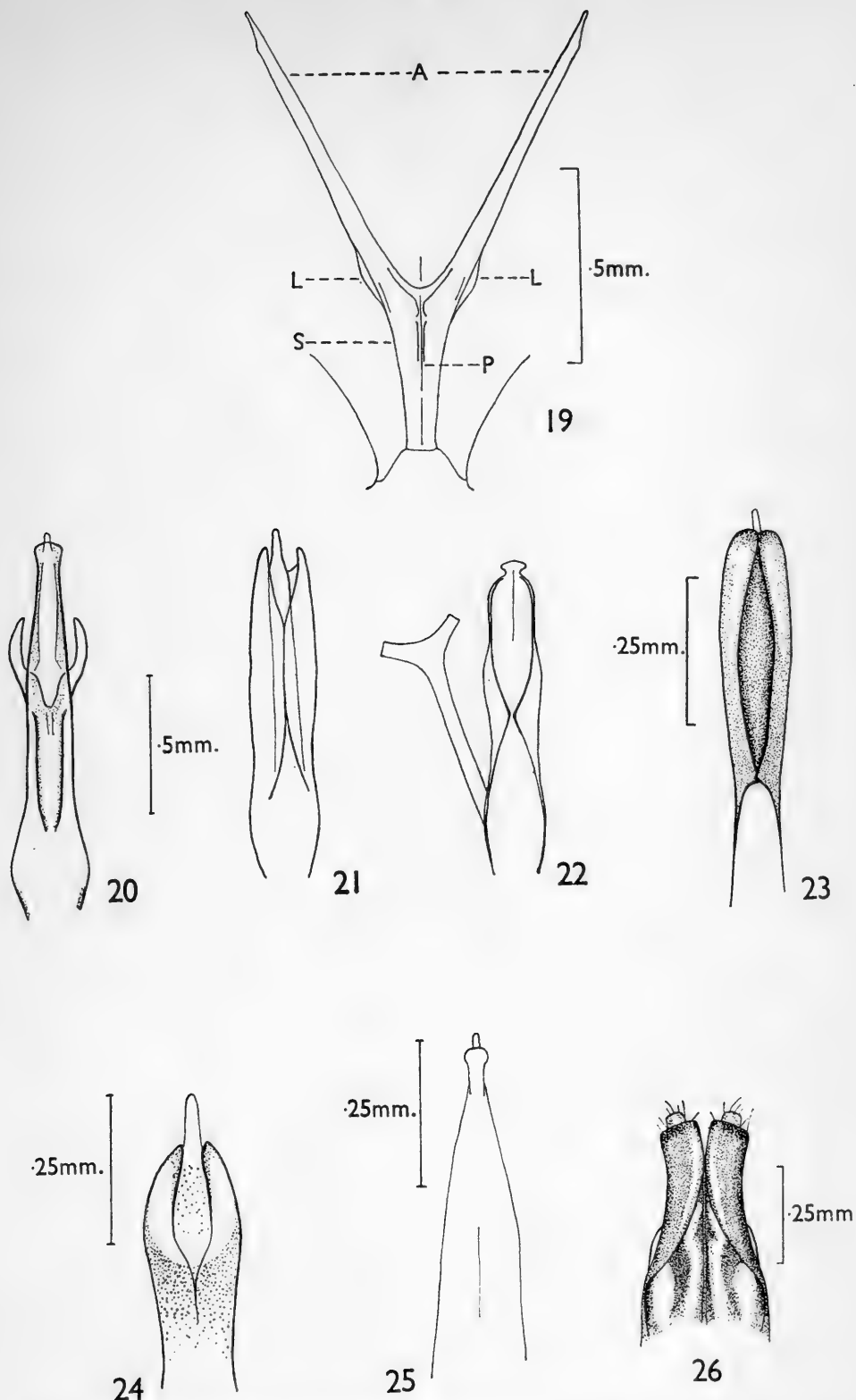
FIGS. 8-11. Wings of—8. *Tetratoma fungorum* F. 9. *Hypophloeus unicolor* (Pill. & Mitt.). 10. *Synchita humeralis* F. 11. *Gnathocerus cornutus* (F.).

Cu., cubitus. K., sub-cubital fleck. M., media. R., radius. Rm., cross vein. Rs., radial sector. W., anal cell. 1-4, anal veins.



FIGS. 12-18. Met-endosternite of—12. *Mycetophagus quadripustulatus* (L.). 13. *Triphyllus bicolor* (F.). 14. *Tetratoma fungorum* F. 15. *Bitoma crenata* (F.). 16. *Orthocerus clavicornis* Er. 17. *Aulonium trisulcum* Geoff. 18. *Colydium elongatum* F.

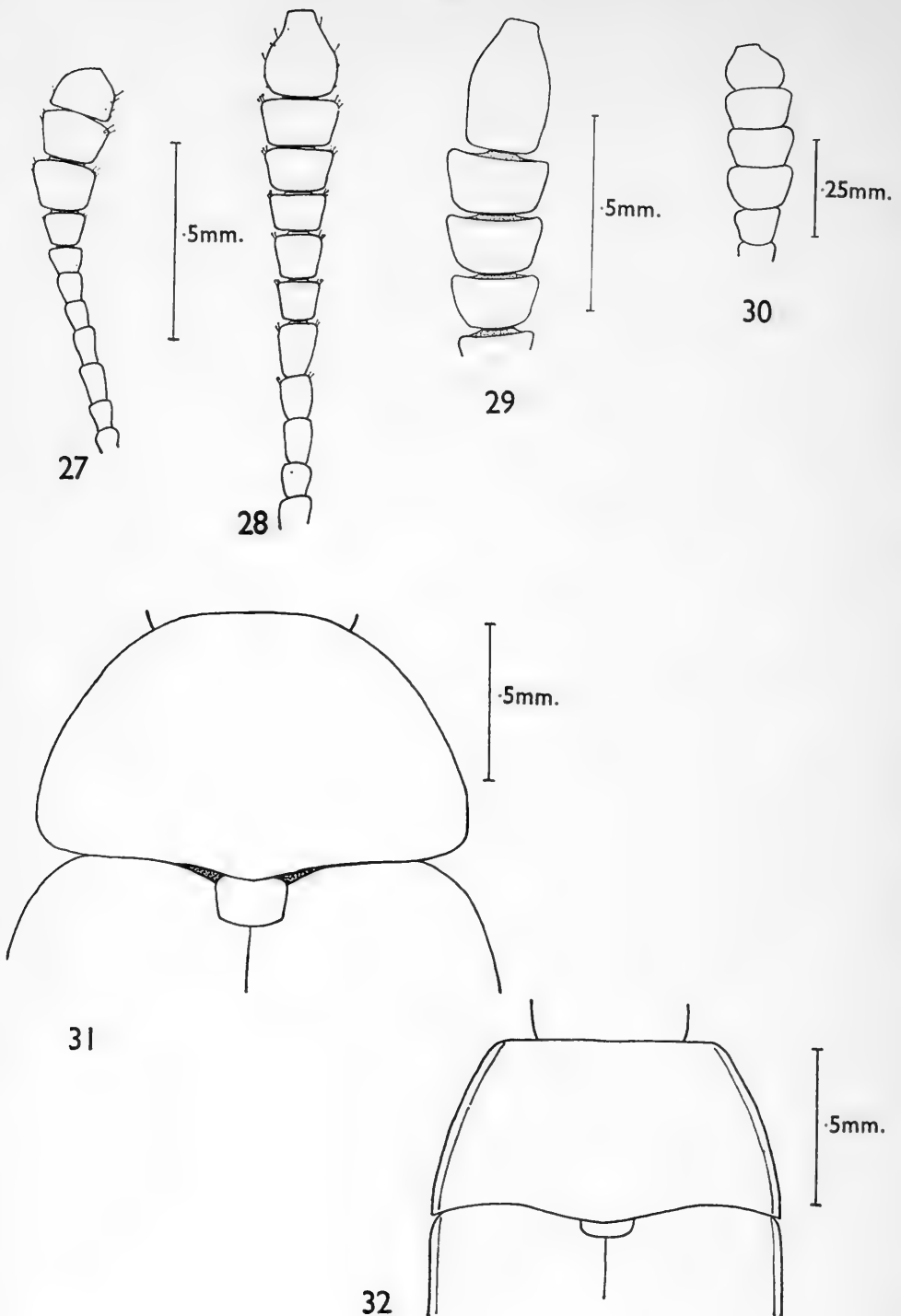
A., arms. L., laminae (or lobes). P., ventral process. S., stem. T., tendons.



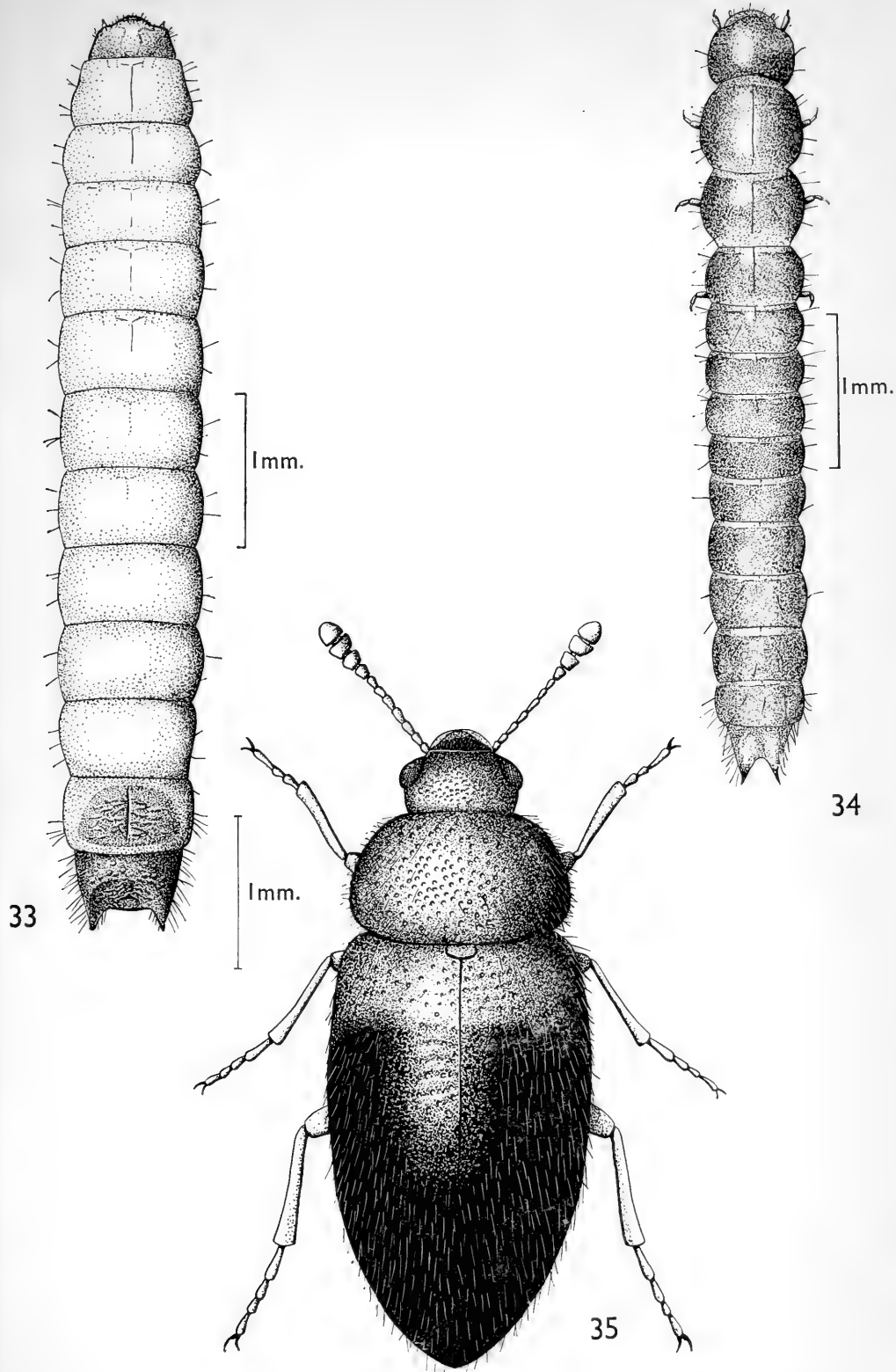
FIGS. 19-26. 19. Met-endosternite of *Hypophloeus unicolor* (Pill. & Mitt.). 20-26. Aedeagus of—20. *Mycetophagus quadripustulatus* (L.). 21. *Tetratoma fungorum* F. 22. *Anthicus floralis* (L.). 23. *Orthocerus clavicornis* Er. 24. *Bitoma crenata* (F.). 25. *Gnathocerus cornutus* (F.). 26. *Hypophloeus unicolor* (Pill. & Mitt.).

A., arms. L., laminae (or lobes). P., ventral process. S., stem. T., tendons.





FIGS. 27-32. 27-30. Antennae of—27. *Triphyllus bicolor* (F.). 28. *Mycetophagus atomarius* (F.). 29. *M. quadripustulatus* (L.). 30. *M. quadriguttatus* Muell. 31. Pronotum of *Triphyllus bicolor* (F.). 32. The same, *Litargus bifasciatus* (Geof.).



FIGS. 33-35. 33. Larva of *Aulonium trisulcum* Geof. 34. The same, *Mycetophagus quadripustulatus* (L.). 35. *Triphyllus bicolor* (F.).



## FIELD MEETINGS, 1955.

## OCKHAM COMMON—9th April 1955.

Leader, Mr. F. D. BUCK.

The weather was very kind for the first field meeting of the year, being bright and sunny all day. Ten members assembled at Effingham Junction with sufficient cars to make the walk to the Common unnecessary. On the drive to the Common the party was delayed a little by the Chiddingfold Farmers Hunt Meet at the Black Swan, but were soon on their way.

The early part of the day was spent on that part of the Common consisting mainly of birch and rhododendrons. Here a birch trunk provided the coleopterists with several *Megatoma undata* (L.) together with the larvae, and a few well-grown larvae of *Ctesias serra* (F.) among the old webs and rejectamenta of spiders. Lepidopterists found larvae of *Parascotia fuliginaria* (L.) on fungus on birch logs in the vicinity.

On the pine and heath area the larvae of the lepidopteron *Ernarmonia coniferana* (Ratz.) were taken in the bark of firs, and *Archiearis parthenias* (L.) was seen flying. The coleoptera here were disappointing, producing only such common insects as *Notiophilus rufipes* Curt., *Metabletus foreatus* (Geof.) and *Exochomus quadripustulatus* (L.).

Lunch was taken near the ponds where larvae of the micro *Limnoecia phragmitella* Stt. were taken commonly in the heads of *Typhae*. During the afternoon the coleopterists found a specimen of *Cychrus caraboides* v. *rostratus* (L.) under a birch log, while an elm log on the edge of the Common produced *Dryocoetes villosus* (F.) and pupae together with *Hypophloeus bicolor* (Ol.), the former being more usual in oak and chestnut, though it has occurred in beech and holly.

The party took a pleasant tea in the tea shop by the station after which several lepidopterists stayed in an unsuccessful search for *Bapta distinctata* H.-S. (*pictaria* Curt.). However they did report the following species: *Orthosia gothica* (L.), *O. incerta* (Hufn.), *O. stabilis* (Schiff.), *Earophila badiata* (Schiff.), *Erannis marginaria* Fab., *Ectropis bistortata* (Goeze), *Selenia bilunaria* (Esp.), and *Tortricodes tortricella* (Hb.).

Coleoptera taken but not mentioned in the foregoing were: *Carabus violaceus* v. *sollicitans* Hart., *Loricera pilicornis* (F.), *Anisodactylus tinotatus* (Fabr.), *Agonum dorsale* (Pont.), *Phosphuga atrata* ab. *brunnea* (Herbst), *Scaphidium quadrimaculatum* Ol., *Stenus clavicornis* (Scop.), *Xantholinus angustatus* S., *Tachyporus obtusus* (L.), *Lochmaea suturalis* (Th.), *Cytilus sericeus* (Forst.).

Mr. G. C. D. Griffiths reports the following two species of Diptera (Agromyzidae) were found in the pupal stage: *Napomyza glechomae* Kalt. (*Glechoma hederacea* L.), *Phytomyza ilicis* Curt. (*Ilex aquifolium* L.).

Finally there was also reported the orthopteron *Tetrix vittata* (Zett.).

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#### BOXHILL—17th April 1955.

Leader, Mr. A. E. GARDNER.

Fourteen members and friends met at the station and proceeded to work the meadow at Burford Bridge. After working the south slope the party proceeded to Happy Valley and returned via Headley Lane.

Although fine and sunny, a cold wind probably prevented many lepidoptera from flying. Species seen included *Archicaris parthenias* (L.) and *Diurnea* (*Chimabache*) *fagella* (Schiff.). A mine of *Aegeria andrenaeformis* (Lasp.) was found and several members believed *Nymphalis polychloros* (L.) was seen.

Coleoptera:—*Bembidion ustulatum* (L.), *B. lampros* (Herb.), *Harpalus rubripes* (Duft.), *Lebia chlorocephala* (Hoffm.), *Sphaeridium scarabaeoides* (L.), *Cercyon haemorrhoidalis* (Fabr.), *C. atomarius* (Fabr.), *C. melanocephalus* (L.), *C. lugubris* (Oliv.), *Phosphuga atrata* (L.), *Agriotes sputator* (L.), *Mycetophagus quadripustulatus* (L.), *Aphodius prodromus* (Brahm), *A. fimetarius* (L.), *A. distinctus* (Mull.), *Phaedon tumidulus* (Germ.), *Pilemostoma fastuosa* (Schall.) and *Orobitis cyaneus* (L.).

Hemiptera:—*Sciocoris cursitans* (Fabr.).

Orthoptera:—*Tetrix vittata* (Zett.).

The following Agromyzidae were recorded by Mr. G. C. D. Griffiths:—*Phytomyza ilicis* Curt. (on *Ilex aquifolium* L.), *P. scolopendrii* R. D. (on *Asplenium ruta-muraria* L.). Also the following species were swept: *P. nigra* Mg. and *P. ranunculi* Schrank.

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#### EFFINGHAM (BARNs THORNS WOOD)—23rd April 1955.

Leader, Mr. T. R. EAGLES.

Ten members and friends attended. The day was fine but not many Spring birds were in evidence. The nightingale was indeed heard but only once. Similarly, the cuckoo called only once or twice. Other birds observed were the willow-warbler, chiffchaff and whitethroat.

Fine growths of *Cardamine flexuosa* With. and *Peplis portula* L. were noted.

About a dozen larvae of *Parascotia fuliginaria* L. were found after many logs had been turned over. In the process several species of Discomycete fungus were collected and some specimens of *Polyporus brumalis* Fr. and *Hymenochaete rubiginosa* Lév. On the logs there

were striking examples of the "Ozonium" of *Coprinus radians* (Desm.) Fr. Some unusually large specimens of the Mycetozan *Reticularia lycoperdon* Bull. attracted attention and there was an abundance of *Leocarpus fragilis* Rost.

The butterflies *Pararge aegeria* L., *Aglais urticae* L., and *Nymphalis io* L. were on the wing. Galls of the Eucosmid moth *Ernarmonia servillana* Dup. were found on the willows.

The Coleoptera noted were:—*Cicindela campestris* L., *Carabus nemoralis* Muell., *Dromius linearis* Ol., *Gauropterus fulgidus* F., *Quedius nigriceps* Kr., *Rhizophagus bipustulatus* F., *Cyrtotriplax bipustulata* F. and *Orchesia undulata* Kr.

Mr. G. C. D. Griffiths records Agromyzidae as follows:—*Melanagromyza simplicoides* Hd. from galls on *Salix* sp. ? *caprea* L. *Phytomyza primulae* R.D. (*Primula vulgaris* Huds.). Also the following species were swept:—*Agromyza cinerascens* Macq. *Phytomyza intermedia* Sp., *P. nigra* Mg., *P. ranunculi* Schrank.

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#### OXSHOT—30th April 1955.

Leader, Mr. F. RUMSEY.

Most of the party met at the railway station, but other members came along during the morning, making a total of 11 all told. It was a fine day, but on the cold side. The route taken was in the direction of the Black Pond and on the way one of the members watched a fox at fairly close range for about five minutes. After lunch by the Black Pond, a certain amount of collecting and searching was done in the vicinity, the party returning by a slightly different route for tea at the refreshment hut near the station.

Birds noted included: Cuckoo, Dabchick, Green Woodpecker, Tree-creeper and Whinchat.

The following lepidoptera were seen:—*Pieris rapae* L., *P. napi* L., *Nymphalis io* L., *Anarta myrtille* L., *Cosymbia albipunctata* Hufn., *Lithina chlorosata* Scop., *Lycia hirtaria* Clerck, *Aethalura punctulata* Schiff., *Ematurga atomaria* L., *Telphusa proximella* Hübn., *Incurvaria pectinea* Haw., and a batch of *Orgyia antiqua* L. ova were found on a birch tree. Larvae: *Lycophotia varia* Vill. (on heather), *Parascotia fuliginaria* L. (under birch logs), *Thera obeliscata* Hübn. and *Evetria turionana* Hübn. (on fir) and *Phthorimaea fraternella* Dougl. (on *Stellaria graminea* L.).

Several specimens of the parasitic fly *Servillia lurida* Fabr. were noted.

Coleoptera were reported as follows:—By Mr. F. J. Coulson: On the slope near the railway station, grubbing beneath the ling produced *Bembidion lampros* Hbst., *Harpalus rufitarsis* Duft., *Bradycellus harpalinus* Serv., *Amara tibialis* Payk., and a dead specimen of *Melanimon tibialis* F. On Esher Common on dung: *Cercyon lateralis* Mm., *C. pygmaeus* Il., *Cryptopleurum minutum* F., *Acrotrichis grandicollis* Mn.,

*A. fuscicularis* Hbst., *A. sericans* H., *Megarthus depressus* Pk., *Philonthus tenuicornis* Mt. & R., *P. pachycephalus* Nord., and *Aphodius tristis* Zenk. From fungi: *Orthoperus mundus* Mh., *Cis hispidus* Pk., and *C. bilamellatus* Fw. Bark working produced: *Phloeonomus planus* Pk., *P. pusillus* Gr. (var. *punctipennis* Th.), *Dinaraea aequata* Er., *Ischnoglossa corticina* Er., and *Trypodendron domesticum* L. Beating was not very productive, but the following were seen: *Chalcoides fulvicornis* F., *Phyllobius pyri* L., *Ceuthorhynchus constrictus* Mm., and *Rhynchaenus rusci* Hbst. By Mr. C. N. Hawkins: *Acupalpus dorsalis* F., *Agonum fuliginosum* Pz., *A. thoreyi* Dj. v. *puellum* Dj., *Lathrobium brunnipes* F., *Ochtheophilum fracticorne* Pk., *Gymnusa brevicollis* Pk., *Bolitochara bella* Mk., *Cyrtotriplax bipustulata* F., and *Cis boleti* Sp.

The following interesting notes were contributed by Mr. T. R. Eagles: The most noticeable mosses were *Polytrichum juniperinum* Hedw. with the calyptra still covering the capsules, *Pohlia nutans* (Hedw.) Lindb. fruiting freely, and *Aulocomnium palustre* (Hedw.) Schwaegr. with many male flowers. In one of the ditches there was the fungus *Mitula paludosa* Fr. growing in the water on decaying leaves and grass. It is a very striking plant with a whitish stem and bright yellow head. Where there had been fires the moss *Funaria hygrometrica* Sibth. was fruiting abundantly. A few patches of the lichen *Peltigera spuria* DC. were noted. Egg cocoons (like little wine glasses) of the spider *Agroeca brunnea* Blackwall were plentiful as usual.

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#### BUXTED, SUSSEX—8th May 1955.

Leader, Mr. D. A. Odd.

About 16 members and friends assembled for this meeting. Large woodlands near Mr. Odd's house were visited and well explored by those present. The weather was rather cold but sunny at times. Numbers of diptera were present on the various spring flowers and sunning themselves on tree trunks. *Mesembrina meridiana* L. was quite common, and a few specimens of *Servillia lurida* F. were taken.

One dragon fly was reported—*Pyrrhosoma nymphula* Sulzer. Several beetles were recorded, the most interesting being *Pyrochroa coccinea* L.; half-a-dozen *Oceoptoma thoracicum* L.—under a dead fox; and a very small *Necrophorus humator* Goeze—under a dead jackdaw. The cold wind no doubt accounted for so few lepidoptera being seen, but a specimen of *Vanessa atalanta* L. was recorded and the early date for this species was commented on. Moths noted included *Asthena albulata* Hufn. (*candidata* Schiff.), *Nemophora swammerdamella* L., and *Pammene argyrana* Hübn. Numbers of plants of Golden Rod (*Solidago virgaurea* L.) were noted in these woodlands, but the meeting was too early in the year to see any of the many species of insects associated with this plant. Some dipterous larvae were discovered by the roadside near Mr. Odd's house feeding in the stems of *Chrysanthemum leucanthemum*, causing the stems to droop, but unfortunately none were bred.

Amongst the Agromyzidae reported by Mr. G. C. D. Griffiths were the mines of *Phytomyza lonicerae* R.D. (on *Lonicera periclymenum* L.), *Phytomyza ilicis* Curt. (on *Ilex aquifolium* L.), *P. nigra* Mg. (on *Deschampsia caespitosa* (L.) Beauv.), *P. primulae* R.D. (on *Primula vulgaris* Huds.). Also the following imagines were swept: *Agromyza cinerascens* Macq., *Phytomyza cineracea* Hd., *P. nigripennis* Fall., *P. ranunculi* Schrank.

About 5 o'clock tea was provided for the party by Mrs. Odd at the house and much enjoyed, after which Mr. Odd showed those present various larvae he was rearing.

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#### ROTHAMSTED EXPERIMENTAL STATION—14th May 1955.

Leader, Dr. C. B. WILLIAMS.

A large party met for this interesting and instructive meeting. All the different branches of entomological research were explained in turn to those present, which necessitated walks through the extensive grounds to the various buildings concerned. The talks ranged from how the numbers of worms, beetles, etc., to the acre were estimated, to the way insects flying at various heights above ground level were counted by means of capturing them in special nets suspended from tethered balloons. Tea was kindly provided by the Station, after which a vote of thanks was passed to Dr. Williams and the other members of the staff who gave such interesting talks and explanations of the various researches carried on by this useful foundation.

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#### CHIDDINGFOLD—22nd May 1955.

Leader, Mr. R. M. MERE.

Some twenty-eight members and friends were present. A number of members came by car, and there was sufficient transport to take everyone from the rendezvous at Witley Station to Durfold Woods.

The weather was cool and dry, with but little sunshine, and very little was on the wing. *Leptidea sinapis* L. was not seen. *Pararge aegeria* L. and *Argynnis euphrosyne* L. were flying in small numbers, and larvae of *Thecla betulae* L. were beaten from sloe. An *Ectropis consonaria* Hübn. was found on a tree trunk. Common species such as *Drepana falcataria* L. and *Pseudopanthera macularia* L. were seen. The day was typical of a very disappointing period with cool weather, and an unusual scarcity of lepidoptera.

The Coleopterists had a more successful day. *Asaphidion flavipes* (L.) were taken under stones in a ditch, an *Achenium depressum* (Grav.) and a *Choleva angustata* (F.) were found under lumps of earth at the edge of a field, a *Cytilus sericeus* (Forst.) was found under a stone in a like locality, *Eusphalerum torquatum* (Marsh.) was beaten from Broom Blossom, an *Orsodacne lineola* (Pz.) was beaten from Hawthorn



as was also a *Rhynchites cupreus* (L.), and *Pyrochroa coccinea* (L.) were found under Birch bark with larvae in various stages of growth. Other beetles noted were *Loricera pilicornis* (F.), *Feronia vernalis* (Pz.), *Bembidion lampros* (Herbst), *Staphylinus winkleri* Bern., *Lathrobium fulvipenne* Grav., *Cantharis pellucida* F., *Rhagonycha testacea* (L.), *R. lignosa* (Mull.), *Phytodecta viminalis* (L.), *Phyllotreta undulata* (Kuts.), *Chalcoides aurea* (Geof.), *C. aurata* (Marsh.), *C. fulvicornis* (F.), *Cylindronotus laevioctostriatus* Goez., *Anaspis frontalis* (L.), *Bruchidius fasciatus* (Ol.), *Apoderus coryli* (L.), *Deporaus betulae* (L.), *Sitona regensteiniensis* (Herbst), *Curculio* (*Balanobius*) *pyrrhoceras* (Marsh.), *Curculio* (*Balaninus*) *nucum* L., *Caenorrhinus nanus* (Pk.), *Anoplus plantaris* Naesz., *Polydrusus tereticollis* (De G.), *Phyllobius pyri* (L.), *Rhynchaenus quercus* (L.) and *Magdalis carbonaria* (L.).

Of Hemiptera-Homoptera *Centrotus cornutus* (L.) was beaten, mainly from Birch.

The following list of Agromyzidae was supplied by Mr. G. C. D. Griffiths. Mines: *Phytomyza lonicerae* R.D. (on *Lonicera periclymenum* L.), *Phytomyza anthrisci* Hd. (on *Anthriscus sylvestris* (L.) Bernh.), *P. sp. nr. cecidonomia* Hg. (on *Hypochaeris radicata* L.), *P. ilicis* Curt. (on *Ilex aquifolium* L.) empty, *P. taraxacocis* Hg. (on *Taraxacum* sp.), new to the British List. Also the following species were swept: *Phytomyza cineracea* Hd., *P. nigra* Mg., *P. ranunculi* Schrank, *P. spondylii* R.D.

Tea was provided by Mrs. Mere at Mill House, Chiddingfold.

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HAM STREET, KENT—28th May 1955.

Leader, Dr. E. Scott.

This rendezvous proved most popular, and it is regrettable that the weather was so very wet, the rain persisting till 3 o'clock in the afternoon, making collecting very unpleasant and sometimes impossible.

The district worked was the woodlands just north of Ham Street Railway Station through a portion of which the railway runs. Late in the afternoon the sun shone through for a time, and in a short while several *Euphyia luctuata* Schiff. were netted and many more seen. They have a habit of fluttering away, gradually rising to tree-top height and then descending too far away to locate them. However, one keen collector found half-a-dozen at rest on tree trunks where it takes a very keen eye to detect them. From females taken ova were obtained and small series bred of the second brood. It was later reported that several members found the moths emerging during December and January instead of at the expected time. Larvae of *Griposia aprilina* L. were found hiding in chinks of the bark of oak trees, and larvae of the local plume *Platyptilia calodactyla* Hübn. were found mining in the crowns of small plants of *Solidago virgaurea* L. Owing to the rain it was a very unpleasant business searching for the latter on the muddy ground.

Other species of lepidoptera reported included: *Argynnis euphrosyne* L., *A. selene* Schiff., *Hemaris fuciformis* L., *Asthena albulata* Hufn., *Anagoga pulveraria* L., *Anania funebris* Stroem, *Microstega pandalis* Hb., *Capua favillaceana* Hb., *Eulia ministrana* L., *Argyroplote lacunana* Dup., *Eucosma latiorana* H.S., *Telphusa scalella* Scop., *Mompha schrankella* Hb. and *Lampronia oehlmanniella* Treits.

Larvae of *Archiearis parthenias* L. were beaten from birches and *Notocelia uddmanniana* L. found in spun shoots of brambles. Old galls caused by larvae of *Mompha nodicolella* Fuchs were seen on the dead stems of *Epilobium angustifolium*, but no galls on the new growths could be found.

One large caddis fly was reported, i.e., *Limnephilus marmoratus* Curtis. The beetle *Cryptocephalus parvulus* Muell. was also taken.

Two interesting orchids were found, namely, *Platanthera chlorantha* (Cust.) Rehb. (Large Butterfly Orchid) and *Listera ovata* (L.) R.Br. (Common Twayblade), and it was mentioned that the very local *Epipactis helleborine* (L.) Crantz (Broad Leaved Helleborine) occurred in the wood.

Tea was provided at the Duke's Head, Ham Street, about 5 o'clock, after which a few members went by cars to the canal just south of the village, where rows of wych elms looked promising for larvae. Those taken by beating included: *Agrochola circellaris* Hufn., *Cirrhia gilvago* Schiff., *Eucosma trimaculana* Don., and *Ypsolophus vittellus* L. Here some of the party heard for the first time the introduced frogs for which these marshes are notorious, rather like ducks quacking as someone remarked.

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#### BENFLEET, ESSEX—5th June 1955.

Leader, Mr. C. H. HARDS.

Owing to the railway strike only five members were able to attend, and one of these failed to find the rest of the party as they arrived late, having been kindly conveyed by car from Upminster by Mr. D. More of Rayleigh. The weather was fine and warm, with a rather strong wind.

Working along the higher ground towards Hadleigh, four larvae of the very local plume *Euenaidophorus rhododactyla* Schiff. were found on wild rose, but all were unfortunately parasitized. This species never appears to be common and a large percentage of the larvae are invariably ichneumonid. Other larvae noted were *Euproctis chrysorrhoea* L., *Allophytes oxyacanthae* L., *Theria rupicapra* Schiff., and *Erannis leucophaearia* Schiff. Webs of *Hyponomeuta variabilis* Zell. were very common on blackthorn, while a solitary bush of spindle contained webs of *Hyponomeuta cognatella* Hb. and two larvae of the more local *H. plumbella* Schiff. After lunch, it was decided to try the salterns and sea wall, where several larvae of *Thetidia smaragdaria* F. were found. This species is now very scarce in the district as the wall

in many places was washed away in the floods, carrying with it the sea wormwood on which the larvae feed. Butterflies noted were: *Pieris brassicae* L., *P. napi* L., *Nymphalis io* L., *Vanessa atalanta* L., and *Polyommatus icarus* Rott.

Numbers of larvae of the beetles *Galeruca tanacetii* L. were found feeding on the leaves of *Centaurea nigra* L.

## EASHING MOORS—11th June 1955.

Leader, Mr. S. WAKELY.

This meeting coincided with the railway strike, but in spite of this about half a dozen members met at Farncombe (near Godalming) and proceeded to the banks of the Wey at Hurtmore. A cold wind, no doubt, accounted for the very few insects which could be flushed from the herbage, but in spite of this numbers of larvae, etc. were obtained by searching among the rich riverside vegetation. After a short spell of light rain the sun broke through and soon dried the herbage. The lovely dragonflies *Agrion splendens* Harris and *A. virgo* L. were quite common. Numerous micro larvae were found, including *Tortrix costana* F. and *Peronea shepherdana* Steph. on *Spiraea ulmaria* L., *Lythrum salicaria* L., *Epilobium hirsutum* L., *Pulicaria dysenterica* L., etc. Folded leaves on some young poplars were found to contain larvae of *Peronea caudana* F., while the gregarious larvae of *Depressaria angelicella* Hb. were abundant on *Angelica sylvestris* L., their spinings being quite conspicuous. On the wooded slopes of the higher ground larval cases of *Coleophora solitariella* Zell. were plentiful on *Stellaria holostea* L., the affected plants showing large white blotches on the leaves where the larvae had been feeding. A few larvae of *Coleophora hemerobiella* Scop. were found on crab apple.

A stop for lunch was made not far from the village of Eashing, after which steps were retraced towards Hurtmore. About five o'clock we all met together for tea outdoors at the Squirrel Inn, Hurtmore.

The following insects were recorded in addition to those already mentioned:—Plecoptera.—*Isoperla grammatica* Poda. Ephemeroptera.—*Ephemera vulgata* L., *Ephemerella notata* Eaton. Odonata.—*Platynemesis pennipes* Pallas., *Pyrrhosoma nymphula* Sulz. Megaloptera.—*Sialis lutaria* L. Trichoptera.—*Mystacides azurea* L. Lepidoptera.—Imagines: *Pieris rapae* L., *P. napi* L., *Scopula lactata* Haw. (*floslactata* Haw.), *Xanthorhoe montanata* Schiff., *Epirrhoë galiata* Schiff., *E. alternata* Müll., *Perizoma affinitata* Steph., *Scoparia ambigua* Treits., *Glyphipteryx fuscoviridella* Haw., *G. fischeriella* Zell. Larvae: *Philudoria potatoria* L., *Arctia caja* L., *Alsophila aescularia* Schiff., *Chesias legatella* Schiff., *Stenoptilia pterodactyla* L., *Depressaria nervosa* Haw., *Coleophora alcyonipennella* Koll., *C. troglodytella* Dup. Coleoptera.—*Eusphalerum torquatum* Marsh., *E. minutum* F., *Cantharis rustica* Fal., *C. pellucida* F., *C. pallida* Goez., *Metacantharis clypeata* Illiger, *Rhagonycha limbata* Thomson, *Malachius bipustulatus* L.,

*Corymbites incanus* Gyl., *Denticollis linearis* L., *Microcara testacea* L., *Byturus tomentosus* DG., *Meligethes lumbaris* Sturm., *Pyrochroa coccinea* L., *P. serraticornis* Scop., *Anaspis regimbarti* Sy., *Grammoptera ruficornis* F., *Donacia simplex* F., *Hydrothassa marginella* L., *Galerucella calvariensis* L., *Bruchidius fasciatus* Ol., *Caenorhinus aequatus* L., *Phyllobius maculicornis* Germ. Hymenoptera.—*Tenthredo amoena* Grav., *Macrophya annulata* Grav. Diptera. — *Xanthogramma pedissequum* Harris, *Platystoma seminationis* L.; *Agromyza mobilis* Mg., *A. anthracina* Mg., *A. spiraeae* Kalt., *Melanagromyza fuscociliata* Hd., *Ceredonta atronitens* Hd., *C. denticornis* Panz., *Liriomyza flaveola* Mg., *Phytobia atra* Mg., *P. incisa* Mg., *Phytogramyza discrepans* Wulp. (new to Britain), *P. orphana* Hd., *Phytomyza nigra* Mg., *P. ranunculi* Schrank, *Napomyza lateralis* Fal. Mines were found of *Phytomyza chaerophylli* Kalt.

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### CHOBHAM COMMON—18th June 1955.

Leader, Dr. C. G. M. DE WORMS.

A very fine day tempered with a strong easterly wind greeted the eight members who arrived by train and car. Shortly after arrival on the ground the local Geometer *Chlorissa viridata* L. was flushed, though most of those seen were past their best. Other Geometers were soon noted; these included *Perconia strigillaria* Hueb. and *Ematurga atomaria* L. Only one *Diacrisia sannio* L. was taken. Butterflies were distinctly scarce. A few *Gonepteryx rhamni* L. were observed and *Coenonympha pamphilus* L. was prevalent on the heath. A notable capture was an imago of *Aegeria sphecoformis* Schiff. settled on a young birch stem, while among the micros, larvae of the local species *Cerostoma lucella* F. were abundant in the spun leaves of scrub oak, together with *Euzophera consociella* Hueb., in lesser numbers. Other larvae seen include a number of half-grown *Dasychira fascelina* L., a few *Anarta myrtili* L. and one *Lasiocampa quercus* L., together with some small *Cerura vinula* L. On turning over a piece of rotten wood inhabited by ants (*Lasius niger* L.) one member noted a small Lycaenid larva which would appear to be that of *Plebejus argus* L. It was hiding in a crevice of the wood and its association with ants in the field had not been fully established before.

In addition two dragonflies were reported, namely, *Anax imperator* Leach and *Libellula quadrimaculata* L. The following beetles were reported by Mr. C. N. Hawkins: *Cicindela campestris* L., *Amara infima* Duft., *Agabus chalconotus* Panz., *Elatер sanguinolentus* Schr., *Cryptocephalus aureolus* Suff., *Phytodecta olivacea* Forst. var. *litura* F., *Luperus longicornis* F. (*rufipes* auctt. Brit. nec Duft.), *Attelabus nitens* Scop., *Apion ulicis* Forst. and *Sitona regensteiniensis* Herbst.

On the botanical side a clump of the rare marsh plant *Kalmia polifolia* Wangerh. was found. The day concluded with a welcome tea in the delightful garden of Rose Cottage just outside Chobham village.

## FAVERSHAM—26th June 1955.

Leaders, Messrs. D. G. MARSH and G. H. YOUDEN.

About a dozen members met at Faversham Station for this meeting and were soon conveyed by those with cars to the quay-side, where the first captures were specimens of the moth *Ephestia elutella* Hb. from the walls of the warehouses. Proceeding along the eastern bank of the creek, the very local plant *Peucedanum officinale* L. (Hog's Fennel) was seen growing in profusion. Larvae of *Depressaria putridella* Schiff. were to be found on almost every plant, but a very large percentage of these were parasitized. A number of coleopterous larvae were also found feeding on the Hog's Fennel and later the beetles were bred and proved to be *Phaedon tumidulus* Gm. A single specimen of the moth *Anania nubialis* Hb. was netted, and some *Hemimene politana* Hb. were taken amongst plants of Yarrow. Other interesting larvae found were *Malacosoma castrensis* L., *Cucullia chamomillae* Schiff., and the micro *Brachmia rufescens* Haw. A number of larvae were found in reed stems (*Phragmites*). These were believed to be *Chilo phragmitellus* Hb., but as none were subsequently bred the species must remain in doubt.

A nest of the Corn Bunting was found containing three eggs, and several of those present said it was the first nest of this bird they had ever seen. It was situated in long grass away from any bushes.

Mr. A. W. Gould and Miss F. A. Ashby reported finding the following coleoptera, Mr. A. A. Allen giving help with identification: *Acupalpus meridianus* L., *Dicheirotichus obsoletus* Dj., *D. gustavii* Cr., *Harpalus aeneus* F., *Amara convexiuscula* Mm., *A. aenea* D.G., *A. strenna* Zi., *Agonum marginatum* L., *A. thoreyi* Dj., *Bembidion guttula* F., *B. assimile* Gy., *B. normannum* Dj., *B. varium* Ol., *Dromius linearis* Ol., *D. melanocephalus* Dj., *Metabletus foveatus* Gf., *Risophilus imperialis* Germ., *Haliphus immaculatus* Gt., *Laccophilus minutus* L., *Gyrinus caspius* Me., *Laccobius biguttatus* Gt., *Coelostoma orbiculare* F., *Falagria thoracica* C., *Tachyporus pusillus* Gr., *T. nitidulus* F., *Quedius tristis* Gr., *Q. pallipes* Lu., *Q. maurorufus* Gr., *Philonthus quisquiliarius* Gy., *Xantholinus linearis* Ol., *X. longiventris* H., *Paederus littoralis* Gr., *Stenus fulvicornis* S., *S. clavicornis* Sp., *Oxytelus complanatus* Er., *Lesteva heeri* Fv., *Phalacrus hybridus* Flach., *Anisosticta novemdecimpunctata* L., *Meligethes aeneus* F., *Enicmus transversus* Ol., *E. histrio* Jy., *Anthrenus verbasci* L., *Athous haemorrhoidalis* F., *Agriotes sputator* L., *A. lineatus* L., *Cyphon ochraceus* S., *Cantharis fulvicollis* F., *Malachius bipustulatus* L., *M. viridis* F., *Anobium punctatum* D.G., *A. fulvicorne* St., *Ochina ptinoides* Mm., *Strangalia melanura* L., *Phaedon cochleariae* F., *Longitarsus succineus* Fd., *Crepidodera ferruginea* Sp., *Chalcoides aurata* Mm., *Isomira murina* L., *Apion flavipes* Pk., *A. meliloti* K., *A. tenue* K., *Otiorhynchus ovatus* L., *Pseudostyphlus pilumnus* Gy., *Ceuthorhynchus contractus* Mm., *C. turbatus* Shz., *C. quadridens* Pz., *C. pyrrhorhynchus* Mm., *Hylastes attenuatus* Er.

A pleasant tea was had about 5 o'clock at the Tudor Bun Shop, which arranged to open their doors specially for this occasion.

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BOOKHAM—3rd July 1955.

Leader, Mr. G. C. D. GRIFFITHS.

Attendance: six members, one of whom had come from as far afield as Grimsby.

The party assembled at Bookham station at 10.45 a.m. During the morning the common was worked, the party moving on to the woods and ponds in the afternoon.

The weather throughout was dull, although there was no rain. The result being that there was very little on the wing, and the lepidopterists in the party had a very poor day. There was no sign of the White Admiral (*Limenitis camilla* L.) or the Purple Hairstreak (*Thecla quercus* L.). Lepidoptera reported included *Pararge aegeria* L., *Aphantopus hyperantus* L., *Spilosoma lutea* Hufn., *Callimorpha jacobaeae* L. (larvae), *Semiothesa alternaria* Hueb., and *Ematurga atomaria* L.

The following Agromyzidae were taken by the leader: *Phytobia pygmaea* Mg. (on *Deschampsia caespitosa* (L.) Beauv.), *Agromyza* sp. (on *Vicia* sp.), *Phytomyza leucanthemi*\* Hg. (on *Chrysanthemum leucanthemum* L.), *P. nigra* Mg. (on *Holcus lanatus* L.), *P. pastinacae* Hd. (on *Pastinaca sativa* L.), *P. periclymeni* de Meij. (on *Lonicera periclymenum* L.). An asterisk signifies empty mines. The Muscid, *Pegomya steini* Hendel was found mining the leaves of *Oxalis acetosella* L.

A very good tea was taken at 4.0 p.m. in the Bookham Grange Hotel.

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DUNGENESE, KENT—9th July 1955.

Leader, Mr. S. WAKELY.

This meeting took place rather farther afield than the majority of the Society's fixtures and proved most enjoyable for those who attended. It was pleasing to see Canon T. G. Edwards present at a field meeting again after his long and serious illness. The party proceeded to the Lighthouse where the cars were parked. Some of those who were unable to manage the long tramp over the shingle stayed in the immediate neighbourhood, and were rewarded by finding half a dozen larvae of *Calophasia lunula* Hufn. on *Linaria vulgaris* Mill. On the shingle many clumps of blackthorn were found forming a mat less than a foot high, with long trailing branches. In some places these growths had been defoliated by the larvae of *Hyponomeuta variabilis* Zell., and it was interesting to see large clusters of the pupae hanging in their loose webs on the branches. A few moths had already emerged, and a number of *Peronea variegana* Schiff. were disturbed from the same plant,

together with a few of the much more local *Euzophera marmorea* Haw. Large clumps of *Dipsacus fullonum* L. (Teasel) were found, in the seed-heads of which several larvae and pupae of *Endothenia gentianana* Hb. were found. Imagines of *Cnephasia longana* Haw. were exceedingly common and a single specimen of *Phalonia zephyrana* Treits. was netted. Larvae of *Eupithecia pulchellata* Steph. were plentiful in the flowers of *Digitalis purpurea* L., which is a common plant in this locality.

Quantities of *Silene nutans* grow among the shingle and larvae of *Coleophora otitae* Zell. were found on the leaves and at the base of the plants. This is the only locality known in the British Isles for this local species, but it is exceedingly common there. Several members collected small bags of the seedheads for larvae, and in addition to various Agrotid larvae large numbers of beetle larvae were also present. These latter were subsequently identified as *Phytonomus arator* L.

Some ponds were visited during the afternoon and the striking *Potentilla palustris* (L.) Scop. (Marsh Cinquefoil) was seen growing in profusion in some places. Several Wainscot larvae were found feeding in the stems of *Typha angustifolia* L. (Narrow-leaved Reed Mace), but the only moth subsequently bred proved to be *Nonagria typhae* Thunb. On the tallows larval cases of *Coleophora viminetella* Zell. were quite common and a few larvae of *Malacosoma neustria* L. were seen. Two species of geometer were frequently flushed from the herbage during the ramble, namely *Pseudoterpna pruinata* Hufn. and *Ortholitha mucronata* Scop., and a few freshly emerged *Synaphe angustalis* Schiff. were seen.

Local plants noted were *Papaver dubium* L., *P. argemone* L., and *Vicia lutea* L.

Although the gorse bushes were searched in vain for webs of *Nephopterix genistella* Dup. it is of interest that two days later a member found a number of webs containing larvae and pupae of this species in one patch of gorse near the miniature railway station by the Lighthouse.

The weather was very warm and sunny and time passed all too quickly. About 5 o'clock the party met for tea at the refreshment rooms by the Lighthouse. One of the party who arrived a little late for tea announced that he had just taken eleven larvae of *Calophasia lunula* Hufn. while walking back! Rather a good wind-up to a most enjoyable day.

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#### CHIPSTEAD—17th July 1955.

Leader, Mr. F. T. VALLINS.

A hot, sunny day was enjoyed by a party of 12 members and friends, but, despite the pleasant weather, most insect life was surprisingly scarce, the only butterfly worthy of note being a rather worn male *Colias croceus* (Fourc.). A few specimens of the Bombardier Beetle, *Brachinus crepitans* (L.), were also taken.







HORSELL, 31.vii.55.



*Standing (left to right):* A. S. Wheeler, C. L. Nissen, M. G. Morris, F. Ellison, R. Platt, R. Eldon Ellison, J. L. Messenger. *Centre:* R. W. J. Uffen, Mrs. R. Platt, Mrs. R. F. Bretherton (*hostess*). *Seated:* M. F. Bretherton, G. C. D. Griffiths, R. F. Bretherton (*leader and host*), James Bretherton, Mrs. Trundell, E. E. J. Trundell.

COSFORD MILL, 21.viii.55.



*Standing (left to right):* Mrs. Chevallier, E. E. J. Trundell, A. W. Gould, Mr. Loarridge (*host*), J. W. Beard, G. C. D. Griffiths, F. T. Vallins (*leader*), L. H. C. Chevallier, Dr. B. P. Moore, C. L. Nissen, A. H. Sperring, Mrs. Sperring, J. L. Henderson. *Seated (left to right):* Miss Ashby, Mrs. Trundell, Mrs. Mary Uridge, Mrs. Loarridge (*hostess*), Miss Loarridge.

[Blocks donated by K. A. Spencer.]

The extremely local Labiate, *Teucrium botrys* L., was found to be flourishing in its usual habitat, but the Ground Pine, *Ajuga chamaepitys* Schreb., was relatively uncommon in the same field. The Round-headed Rampion, *Phyteuma tenerum* R. Schulz, was observed to be holding its own at the top of the Down, where it had been seen for some years.

Agromyzid Diptera as reported by Mr. G. C. D. Griffiths are given with the plant on which they were found, an asterisk indicates mines only were taken. *Agromyza alnibetulae* Hd. (*Betula verrucosa* Ehrh.), *A. anthracina* Mg. (*Urtica dioica* L.), *A. dipsaci* Hd. (*Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *A. nana* Mg. (*Trifolium* sp.), *A. spiraeae* Kalt. (*Potentilla reptans* L.) *Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Garcke), *P. labiatarum* Hd. (*Stachys sylvatica* L. and an unidentified Labiate), *P. verbasci* Bouché (*Verbascum thapsus* L. and *Scrophularia nodosa* L.), *Liriomyza pascuum*\* Mg. (*Euphorbia amygdaloides* L.), *L. strigata* Mg. (*Campanula trachelium* L.), *L. violiphaga*\* Hd. (*Viola riviniana* Rehb. or *reichenbachiana* Jord.), *Napomyza glechomae*\* Kalt. (*Glechoma hederacea* L.), *Phytomyza atricornis* Mg. (*Senecio jacobaea* L.), *P. chaerophylli* Kalt. (*Chaerophyllum temulum* L.), *P. conyzae* Hd. (*Inula conyza* DC.), *P. crassiseta* Zett. (*Veronica* sp.), *P. lappina* Gour. (*Arctium* sp.), *P. pastinacae* Hd. (*Pastinaca sativa* L.), *P. ramosa* Hd. (*Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *P. ranunculi* Schrank (*Ranunculus* sp.), *P. spondylii* R.D. (*Heracleum sphondylium* L.), *Cerodonta denticornis* Panz. was also swept.

Although insects were so infrequent, the party had a most enjoyable, though torrid, day. Tea was taken at Dean Farm.

## BOXHILL—24th July 1955.

Leader, Mr. F. D. BUCK.

Twenty members and guests attended the meeting on a day that was somewhat overcast and which remained so for the greater part of the day.

On the southern slopes of the Boxhill the lepidopterists took *Polyommatus icarus* (von Rott.), *Lysandra coridon* (Poda), *Hesperia comma* (L.) and *Eumenis semele* (L.). Whilst the coleopterists in the same area recorded *Mordellistena humeralis* (L.), *Cryptocephalus fulvus* Goeze, *Longitarsus luridus* (Scop.), *Tychius juncus* (Reich.) and *Stenus cicindeloides* (Schall.) all by general sweeping.

Coleoptera in the woods at the top of the hill included *Sinodendron cylindricum* (L.) in a fallen beech with the larvae of *Melanotus rufipes* (Herbst). From a largish patch of raspberries growing wild were swept *Byturus urbanus* (Lind.) and *Eusphalerum luteum* (Marsh.). The environments of Happy Valley produced a single specimen of *Licinus depressus* (Payk.) from beneath a stone, *Chrysolina hyperici* (Forst.) and *Cryptocephalus bilineatus* (L.) were swept from *Hypericum* in a very restricted area, *Aphthona euphorbiae* (Schr.), *Apion loti* Kirby,

*Denticollis linearis* L. ♂♂ only by general sweeping and in the flower heads of hawkweed *Cryptocephalus hypchoeridis* Schiff. was not uncommon.

Our lepidopterists reported taking or seeing the following imagines: —*Lycaena phlaeas* (L.), *Ortholitha chenopodiata* (L.) (*limitata* Scop.), *Thymelicus sylvestris* (Poda), *Salebria semirubella* (Scop.), *Oxyptilus parvidactylus* (Haw.), *Platyptilia ochrodactyla* (Schiff.), *Zygaena filipendulae* (L.), *Hemimene flavidorsana* (Knaggs), *Hyponomeuta plumbella* (Schiff.) and *Ethmia decemgutella* (Hueb.); this last named on Gromwell. The larvae included *Callimorpha jacobaeae* (L.), *Scoliopteryx libatrix* (L.), *Euclidimera mi* (Clerck), *Smerinthus ocellatus* (L.), *Cerura vinula* (L.) and *Phalonia gilvicomana* (Zell.).

Diptera reported by Mr. G. C. D. Griffiths with plants are as follows, an asterisk indicates the record is based on empty mines.: *Agromyza alnibetulae*\* Hd. (*Betula* sp.), *Phytobia flavifrons* Mg. (*Silene cucubalus* Wibel), *P. labiatarum* Hd. (*Teucrium scorodonia* L.), *Liriomyza cicerina* Rond. (*Ononis repens* L.), *I. polygalae*\* Hg. (*Polygala* sp.), *Phytomyza langei* Hg. (*Salix caprea* L.), *Phytomyza atricornis* Mg. (*Chrysanthemum leucanthemum* L.), *P. scabiosae* Hd. (*Scabiosa columbaria* L.). Empty mines were found on *Verbena officinalis* L. which cannot be attributed to any species hitherto known to feed on this plant. They may possibly be produced by *Phytobia labiatarum* Hd., hitherto recorded only from Labiatae. Larvae of the two following leaf-mining Muscids were also taken: *Pegomya seitenstettensis* Strobl (*Oxalis acetosella* L.), *P. steini* Hendel (*Cirsium arvense* (L.) Scop. and *C. palustre* (L.) Scop.).

Amongst the plants noted were the Ground pine and the Pyramidal orchid, whilst the only bird song reported was that of the Blackcap. An excellent tea was taken at the "Stepping Stones" tea rooms where the day's work was, as usual, discussed at great length.

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#### HORSELL COMMON—31st July 1955.

Leader, Mr. R. F. BRETHERTON.

Eleven members and friends met at Woking Station, and four more joined later. The morning was spent in working the heathery bog and pine wood west of the Bleak House Inn. The day was fine and hot, but, possibly because of the heat, insects were not flying freely and were difficult to disturb. Among the butterflies, *Plebejus argus* L. and *Eumenis semele* L. were common, and single specimens were taken of *Limenitis camilla* L., *Polygonia c-album* L., and *Lycaena phlaeas* L. ab. *caeruleopunctata* Ruhl. Among the moths, *Plusia gamma* L. was a plague, there were numbers of *Lygris testata* L., *Eupithecia goossensiata* Mabille, and *Anarta myrtili* L., and a single specimen of *Sterrhia sylvestraria* Hubn. Besides several larvae of *Macrothylacia rubi* L., there was a nearly full-fed *Saturnia pavonia* L., miserably decorated

with three white eggs of a parasitic fly or ichneumon. On this the hymenopterous expert of the party performed (during tea) a skilful surgical operation, and it is hoped that the patient's life will be saved. The Sundew, *Drosera rotundifolia* L., was abundant in the bog, and it was interesting to find also the much scarcer *D. anglica* Huds.

After lunch the party adjourned to an abandoned and waterfilled gravel pit on the outskirts of Ottershaw, which seemed pleasantly cool after the heath. A few specimens of the fine Plume Moth, *Platyptilia ochrodactyla* Schiff., were disturbed from clumps of tansy (*Tanacetum vulgare* L.), and a number of pupae of *Nonagria typhae* Thunb. were obtained. The botanists were pleased by the sight of a flourishing colony of young plants of the Royal Fern (*Osmunda regalis* L.), which is by no means so rare in this district as is often stated.

A list of diptera determined by Mr. G. C. D. Griffiths is appended.

\*Indicates empty mines only:—

*Agromyza alnibetulae*\* Hd. (on *Betula verrucosa* Ehrh.), *A. johannae*\* de Meij. (on *Sorothamnus scoparius* (L.) Wimmer), *Phytomyza atricornis* Mg. (on *Hieracium "sabaudum"*), *P. tanacetii* Hd. (on *Tanacetum vulgare* L.). Larvae of an *Agromyza* sp. were found feeding in the leaves of young seedlings of *Ulex europaeus* L. (a plant from which no *Agromyzid* has hitherto been recorded). Prof. Hering has examined these larvae and states that they probably are those of *Agromyza johannae* de Meij. (which normally feeds on Broom).

Mrs. Bretherton entertained the party to tea at Ottershaw Cottage. Afterwards, the botanists visited a spot on a neighbouring common where the beautiful North American ericaceous plant, *Kalmia polifolia* Wangenh., is naturalised.

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#### CHILWORTH—6th August 1955.

Leader, Mr. S. WAKELY.

Owing to illness, Mr. Rumsey was unable to be leader, so Mr. S. Wakely acted in his stead.

The party moved off from Chilworth Station soon after 11 o'clock and proceeded to Black Heath. On the way a single larva of *Phtheocroa rugosana* Hb. was found among spun leaves of *Bryonia dioica* Jacq. The weather being so very warm very little beating for larvae was attempted. Two tortrices were noticed in numbers among the heather and small firs. Examples netted proved to be *Euxanthia angustana* Hb. and *Eulia politana* Haw. Butterflies noted were *Plebejus argus* L. and *Eumenis semele* L. Walking through the heather disturbed many specimens of *Eupithecia goossensiata* Mab., together with a few *Selidosema brunnearia* Vill. Some of the latter were quite fresh, while others were very rubbed and worn. A lovely fresh specimen of the local *Sterrha sylvestraria* Hb. was netted, together with the more common *Lygris testata* L.

The ground being so very parched and dry it was decided to descend the lane leading to Shamley Green for about a quarter of a mile, where some swampy ground was visited. Here larvae of *Elachista paludum* Frey. were found in leaves of *Carex paniculata* L. and a single moth was bred a month later. Interesting plants noted were *Corydalis claviculata* D.C., *Valeriana officinalis* L., and *Galeopsis tetrahit*.

Retracing our steps, we visited a hilly field bordered by Derry Wood, where a number of plants of *Verbascum nigrum* L. in full bloom were admired. A surprise here was the glimpse of a single specimen of *Strymonidia w-album* Knoch busy on a head of ragwort. It was a rather shabby specimen and no great loss to the member who attempted to net it—and missed! By searching some plants of *Lychnis alba* Mill several larvae of *Hadena bicruris* Hufn. and *Perizoma affinitata* Steph. were discovered.

Mr. G. C. D. Griffiths's Agromyzid captures were as follows:—  
 Mines.—*Phytobia posticata*\* Mg. (on *Solidago virgaurea* L.), *P. verbasci*\* Bouché (on *Scrophularia nodosa* L.), *P. sp.* (on *Carex paniculata* L.), *Liriomyza trifolii* Burgess (on *Medicago sativa* L.), *Phytomyza hendeliana*\* Her. (on *Lonicera periclymenum* L.), *Phytomyza calthophila* Hg. (on *Caltha palustris* L.), *P. sp. nr. cecidonomia* Hg. (on *Hypochaeris radicata* L.), *P. virgaureae*\* Hg. (on *Solidago virgaurea* L.). \*Indicates an empty mine. Also the following were swept:—*Phytobia atra* Mg., *P. pygmaea* Mg., *Cerodonta fulvipes* Mg., *Liriomyza flaveola* Fall., *Phytomyza ranunculi* Schrank.

Tea was provided at Lockners Farm Guest House, where, in view of the warm day, the huge outsize in teapots was much appreciated—at least by the members who had not to perform the weight-lifting act of keeping the cups filled. On leaving, the party took note of two huge Sequoia trees or Wellingtonias growing on each side of the house, and were told that the property was at one time part of Albury Park, which is still noted for its magnificent trees from all parts of the world.

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BETCHWORTH—14th August 1955.

Leader, Mr. D. W. THORPE-YOUNG.

After a very heavy rain storm the previous night and the morning being dull and damp, the leader was pleased to find three other members at the rendezvous, and two of these had come all the way by car from south Hampshire. Three more joined the party having arrived later.

The ground was muddy and the herbage very wet, but in spite of this a few *Aspitates gilvaria* Schiff. were disturbed, including a female which is always more difficult to flush than the other sex. *Scopula ornata* Scop. was also taken. It was not until 3.30 p.m. that the sun broke through, and very soon numbers of the local *Hesperia comma* L. were to be seen on the wing, some of the members taking this species for the first time. Other butterflies seen were *Colias croceus* Fourc. and *Eumenis semele* L. One member reported taking *Horisme*

*italbata* Schiff., and an unusual capture was a specimen of *Loxostege sticticalis* L. on the downs. On the railway bank large clumps of *Campanula trachelium* L. were noticed, and a small bag of seedheads collected by one of the party was later found to contain numbers of the larvae of *Eupithecia denotata* Hueb. Another interesting find was the larvae of *Oidaematophorus carphodactylus* Hueb. in the flowers of *Inula conyza* DC. A number of moths were bred later, but a large percentage of the larvae were parasitized.

Several of the party ascended the downs and then crossed the top of a large chalk quarry to the old bomb crater that caused much interest in botanical circles some years ago owing to the numbers of rare and non-indigenous plants found to be growing there. On the way masses of *Galeopsis tetrahit* L. were seen in flower. Some of the usual plants were still flourishing in the crater itself, particularly the large-leaved *Inula helenium* L. (Elecampane), the plants noted were *Digitalis lanata* Ehrh., *Dosyncnium herbaceum* Vill. (Legume), and *Beta trigyna* Waldst. & Kit. There is a large pond between the railway and the downs and not far from this a number of Foxglove plants were discovered—two in bloom. These had evidently sprung up from seed of one of the bomb crater species, dropped there by someone previously. The flowers were a deep yellow spotted with reddish-brown and very striking, the species being thought to be *Digitalis ferruginea* L.

Mr. G. C. D. Griffiths took and determined the following Diptera, an asterisk indicates that only empty mines were found. *Agromyza dipsaci*\* Hd. (on *Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *A. nana* Mg. (on *Trifolium pratense* L.), *Phytobia pygmaea* Mg. (on *Dactylis glomerata* L.), *Phytobia* sp. (on *Brachypodium sylvaticum* (Huds.) Beauv.), *Liriomyza centaureae*\* Hg. (on *Centaurea nigra* L.), *Phytagromyza langei* Hg. (on *Salix capreae* L.), *P. similis*\* Brisch. (on *Knautia arvensis* (L.) Coult.), *Phytomyza* ? *adjuncta* Hg. (on *Pimpinella saxifraga* L. and *P. major* (L.) Huds.), *P. agromyzina* Mg. (on *Cornus sanguinea* L.), *P. brunnipes* Brisch. (on *Sanicula europaea* L.), *P. conyzae* Hd. (on *Inula conyza* DC. and *I. helenium* L.), *P. lappina*\* Gour. (on *Arctium* sp.), *P. pastinacae* Hd. (on *Pastinaca sativa* L.), *P. ramosa*\* Hd. (on *Dipsacus fullonum* L. s.sp. *sylvestris* (Huds.) Clapham), *P. scabiosae* Hd. (on *Scabiosa columbaria* L.), *P. silae* Hg. (on *Silaum silaus* (L.) Schinz & Thell.), *P. sisonis* Hg. (on *Sison amomum* L.) new to the British List, *P. spondylii* R.D. (on *Heracleum sphondylium* L.), *P. tordylii* Hd. (on *Torilis japonica* (Houtt.) DC.).

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COSFORD MILL, THURSLEY, SURREY—21st August 1955.

Leader, Mr. F. T. VALLINS.

This meeting was arranged on the kind invitation of Mr. and Mrs. Loarridge, the owners of Cosford Mill. The mill, in an extreme state of dereliction, was purchased by them a few years ago, with



the adjoining land of about thirteen acres. By dint of much hard work and the exercise of good taste, they have transformed it into a charming, comfortable home. Where conditions allowed, ancient features of antiquarian interest have been carefully preserved. Parts of the building are reputed to date from the fifteenth century, and most of the mill machinery, mainly constructed of wood, is still intact. Unfortunately, the overshot wheel was taken for scrap metal during the last war. The mill is situated at the lower end of a lake, which formerly supplied it with power. This lake is in a ravine, one side of which is very steep and dangerous, and difficult to explore. The other side, which has a more gentle slope, gives birth to a number of springs, which feed the lake and create a considerable area of swamp. Many water-fowl live and breed in this almost inaccessible spot.

The land attached to Cosford Mill has never been cultivated, and the tangled undergrowth and marshy conditions render much of it almost impenetrable. There is much fallen and decaying timber. Alders, willows and salallows abound. It is the intention of the owner to treat his estate as a nature reserve, and to retain it in its present condition, except for a little judicious thinning.

Sixteen members and friends were collected by car at Milford Station, or drove direct to the mill. The day was extremely hot and promising. The party was first escorted along the main path skirting the rim of the ravine, and was then left to collect at will. Butterflies were very common, although nothing unusual was taken. It was particularly pleasing to see large numbers of *Vanessa atalanta* (L.) sunning themselves on the flowers of Hemp Agrimony, and several specimens of the Dragonfly, *Aeshna grandis* (L.) were flying up and down the lake. The coleopterists found a number of interesting species, details of which are given. A Kingfisher was observed, and was seen to make its characteristic flat dive, with wings outstretched, when taking a fish from the water.

Permission had been granted for the party to visit the grounds of the adjoining estate of Cosford House, with its beautiful lake, bordered with rhododendron bushes.

Owing to the increasingly oppressive heat, relatively little collecting was done after lunch, and many of the party spent the afternoon watching the shoals of perch from the shady bank of the lake.

Tea was most generously provided at the mill by Mrs. Loarridge, and terminated what had been a most delightful day.

Coleoptera.—*Cychrus caraboides* (L.) v. *rostratus* (L.), *Leistus fulvibarbis* Dej., *L. ferrugineus* (L.), *Nebria brevicollis* (F.), *Notiophilus rufipes* Curtis, *N. biguttatus* (F.), *Elaphrus cupreus* Duft., *Bembidion nitidulum* Marsh., *B. ustulatum* (L.), *B. genei* Kust. v. *illigeri* Net., *B. articulatum* (Panz.), *B. harpaloides* (Serville), *B. lunulatum* (Geof.), *Patrobus atrorufus* (Strom.), *Bradycellus harpalinus* (Serville), *Amara plebeja* (Gyll.), *Feronia madida* (F.), *Abax parallelipedus* (Pill. et Mitt.), *Calathus piceus* (Marsh.), *Agonum ruficorne* (Goeze), *Dromius*

*linearis* (Ol.), *D. quadrimaculatus* (L.), *Agabus bipustulatus* (L.), *Anacaena limbata* (F.), *Helophorus minutus* (F.), *Laccobius sinuatus* Ms., *L. nigriceps* Th., *L. alutaceus* Th., *Ocytelus rugosus* (F.), *Stenus ciciindeloides* (Schaller), *Dianous coerulescens* (Gyll.), *Baptolinus alternans* (Gr.), *Philonthus fimetarius* (Gr.), *Quedius picipes* (Mn.), *Cerylon ferrugineum* Steph., *Meligethes viridescens* (F.), *M. atratus* (Ol.), *Subcoccinella vigintiquatuorpunctata* (L.), *Calvia quatuordecimpunctata* (L.), *Mycetophagus quadripustulatus* (L.), *Dorcus parallelepipedus* (L.), *Sinodendron cylindricum* (L.), *Rhinosimus planirostris* (F.), *Lagria hirta* (L.), *Zeugophora subspinosa* (F.), *Galerucella pusilla* (Df.), *Apion assimile* K., *A. flavipes* (Pk.), *Sitona flavescens* (Marsh.), *S. lineatus* (L.), *Cionus scrophulariae* (L.), *Ceuthorhynchidius troglodytes* (F.).

Hymenoptera.—*Tenthredo scrophulariae* L. (Sawfly), *Ancistrocerus parietum* (L.) (Solitary Wasp).

Diptera.—*Episyrphus balteatus* (Degeer), larvae of the Trypetid *Spilographa immaculata* Macq. were also found mining the leaves of *Taraxacum* sp. Agromizidae determined by Mr. G. C. D. Griffiths, with the plants on which they were taken; \*indicates the mines only taken. *Agromyza* ? *airae* Karl (*Deschampsia caespitosa* (L.) Beauv.), *A. anthracina* Mg. (*Urtica dioica* L.), *Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Garcke), *P. s nderupi* Hg. (*Carex pendula* L.), *Liriomyza eupatorii* Kalt. (*Eupatorium cannabinum* L. and *Galeopsis tetrahit* L. agg.), *L. strigata*\* Mg. (*Valeriana officinalis* L.), *L. trifolii* Burgess (*Trifolium pratense* L. and *Vicia sepium* L.), *Napomyza xylostei*\* Kalt. (*Lonicera periclymenum* L.), *Phytomyza angelicae* Kalt. (*Angelica sylvestris* L.), *P. angelicastris*\* Hg. (*Angelica sylvestris* L.), *P. atricornis* Mg. (*Eupatorium cannabinum* L.), *P. calthophila*\* Hg. (*Caltha palustris* L.), *P. eupatorii*\* Hd. (*Eupatorium cannabinum* L.), *P. primulae* R. D. (*Primula vulgaris* Huds.), *P. scolopendrii* R.D. (*Polypodium vulgare* L. and *Phyllitis scolopendrium* (L.) Newm.), *P. sonchi* R.D. (*Lapsana communis* L.), *P. symphyti* Hd. (*Myosotis palustris* L.). *Cerodonta fulvipes* Mg. was swept.

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STANFORD-LE-HOPE—27th August 1955.

Leader, Mr. W. J. WATTS.

Lepidopterists outnumbered coleopterists at this meeting, and many interesting insects were noted. Butterflies seen were: *Aglais urticae* L., *Vanessa atalanta* L., *Lycaena phlaeas* L. and *Polyommatus icarus* Rott. Moths taken included one *Agrotis ipsilon* Rott., *Ortholita chenopodiata* L. and *Aspitates ochrearia* Ross., the latter being fairly common. Eight fine larvae of *Smerinthus ocellatus* L. were taken on a small apple tree growing on the sea wall. Larvae of *Notodonta ziczac* L., *Scoliopteryx libatrix* L., *Phalera bucephala* L., and *Biston betularia* L. were found on willow. By sweeping and searching the flowers of



Sea Aster numbers of larvae of *Cucullia asteris* Schiff. were taken, ranging from very small ones to others practically full fed. Interesting micro larvae found included *Phalonia hybridella* Hb. (common in flowers of *Picris echioides* L.) and *Telphusa scriptella* Hb. (common on maple by the roadside leading to the marshes, feeding between neatly folded leaves). A few larvae in rolled elm leaves turned out to be *Cacoecia pronubana* Hb.

A specimen of the large water beetle *Hydrophilus piceus* (L.) was found at the top of a flowering stem of *Aster tripolium* L., and it seemed rather a mystery how it got there. Not long after, as the party were settling down for lunch overlooking large clumps of the Sea Aster, suddenly another specimen of this local beetle was seen scrambling up a stem. It reached the top in a matter of seconds and the agility of this clumsy-looking insect was remarkable. Presumably both these specimens had recently emerged from pupae and were seeking a convenient site to take off, in spite of the fact that its normal flight time is after dark. Both specimens were females and the ditch nearby was brackish, as the sea water ascended it at every high tide. Other beetles taken were: *Elaphrus cupreus* Duft., *Bembidium guttula* (F.), *B. obtusum* Serv., *Dicheirotichus gustavii* Ch., *Pogonus chalceus* (Marsh.), *Amara convexiuscula* (Marsh.), *Agonum marginatum* (L.), *A. ruficorne* (Goeze), *A. fuliginosum* (Panz.), *A. gracile* (Gyl.), *Coelostoma orbiculare* (F.), *Hydrobius fuscipes* (L.), *Anthocomus rufus* (Herbst), *Olibrus millefolii* (Payk.), *Subcoccinella vigintiquatuorpunctata* (L.), *Coccidula rufa* Hb., *C. scutellata* (Herbst), *Anisosticta novemdecimpunctata* (L.), *Coccinella undecimpunctata* L., *Thea vigintiduopunctata* (L.), *Phaedon tumidulus* (Germ.), *Sitona regensteiniensis* (Herbst), *S. lineatus* (L.), *S. hispidulus* (F.).

The following Agromyzidae are recorded by Mr. G. C. D. Griffiths. \*indicates empty mines only. *Agromyza nana* Mg. (*Medicago sativa* L.), *Phytobia humeralis*\* v. Ros. (*Aster tripolium* L.), *P. ? morosa* Mg. (*Scirpus maritimus* L.), *Liriomyza amoena*\* Mg. (*Sambucus nigra* L.), *L. cicerina*\* Rond. (*Ononis repens* L.), *L. pusio* Mg. (*Tragopogon pratensis* L.), *Phytomyza affinis*\* Fall. (*Cirsium arvense* (L.) Scop.), *P. sp. nr. cecidonomia* Hg. (*Hypochaeris radicata* L.). Also *Agromyza nana* Mg. was swept.

Once again a pleasant tea was had in the centre of the village and handy to the station for our return.

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OCKHAM—3rd September 1955.

Leader, Mr. T. R. EAGLES.

The long dry spell which had preceded this meeting had altered many of the familiar spots. Small ponds had completely dried up and it was possible to walk over them on the mud which was hard and broken up by great cracks. It was thus easy to examine the ferns growing on the sides of the ponds and in the usually boggy places

round about. In addition to the common male fern there were some handsome specimens of *Dryopteris spinulosa* (Mull.) Watt and *D. austriaca* (Jacq.) Woy. At times we found ourselves using the dried up stream beds as footpaths.

Possibly another effect of the wonderful summer was the strikingly abundant crop of fruit on the Honeysuckles (*Lonicera periclymenum* L.) and on the Alder buckthorns (*Frangula alnus* Mill.).

A number of half-grown larvae of *Clostera curtula* L. were found by looking for sewn up leaves on Aspen. As is often the case these were all on one bush: there seemed to be none on the bushes nearby.

Beating the birches and willows for Lepidopterous larvae was fairly productive. *Drepana lacertinaria* L., *Cosymbia pendularia* Clerck, *Notodonta ziczac* L., *Biston betularia* L., *Ectropis bistortata* Goeze and *Lomaspilis marginata* L. Other larvae noted were *Apatele megacephala* F. and *Bena fagana* F. (*prasinana* Auct nec L.).

One *Colias croceus* Fourc. was taken and several *Lygria testata* L. were flushed from the heather. The members beating for larvae reported several examples of *Meconema thalassina* Deg. (Orth.) and an imago of the moth *Scoparia truncicolella* Staint. A series of imagines of *Crambus hamellus* Thnbg. was taken.

Some of the party went to the Wisley pond to see if the introduced *Calla palustris* L. was still there. It was flourishing and there were a large number of clusters of fruit. Near by there were plants of *Typha latifolia* L. and the dead central leaves made it clear that they had been attacked by the larva of *Nonagria typhae* Thnbg. One would expect that the moths would all have emerged some time ago but in fact only one empty pupa case was found. A member of the party wanted the moth and in a very short time enough pupae were collected.

By searching the leaves of *Solanum dulcamara* L. in a spot where ordinarily gum boots would have been needed a good supply of the larvae of the Plutellid *Acrolepia autumnitella* Curt. was secured. They could readily be seen by holding blotched leaves up to the light. Many promising spun leaves of birch were collected and a few *Gracillaria populetorum* Zell. bred later. On the way back to the station a colony of *Peronia boscana* F. was found on some elms. Larvae of *Homoeosoma binaevella* Hb. were found on thistles.

Two conspicuous members of the other orders were the large robber fly *Asilus crabroniformis* L. and the long-horned grasshopper *Meconema thalassina* Deg.

The great spotted woodpecker was heard many times: apart from this not much bird life was noted. *Orchis ericetorum* E. F. Linton, *Carex pseudocyperus* L. and *Scutellaria minor* L. were the most interesting plants. It was too dry for fungus and nothing was seen except a very few *Russula nigricans* Fr., *R. cyanoxantha* (Schaeff.) Fr. and *Lactarius pyrogalus* (Bull.) Fr.

As for many years tea was taken at the rooms near Effingham Junction Station.

## SPARROW COMMON, near BROMLEY, KENT—11th September 1955.

Leader, Mr. R. F. HAYNES.

In spite of extensive building development in the immediate neighbourhood, this locality which consists of three large fields bordered by thick woodland of mixed vegetation, has so far remained very rural. The area was last visited by this Society in September 1950.

The weather for this meeting turned out to be dull, cloudy and rather cool all day, but fortunately no rain fell until early evening, so that collecting did not suffer. Five members assembled at the 'bus stop outside Bromley South station and proceeded by bus to Southborough, whence a walk of about  $\frac{3}{4}$  of a mile brought them to the collecting ground. Two late arrivals joined the party during the day.

Those who had brought beating trays worked birches, oaks, willows, and aspens and among a mixed bag of larvae the following species were identified:—*Notodonta ziczac* L., *N. dromedarius* L., *Phalera bucephala* L., *Clostera pigra* Hufn., *Drepana binaria* Hufn., *D. falcatoria* L., *D. lacertinaria* L., *Cilix glaucata* Scop., *Apatele megacephala* Schiff., *Melanchra persicariae* L., *Ceramica pisi* L., *Comibaena pustulata* Hufn., *Cosymbia albipunctata* Hufn. (*pendularia* auctt.), *Opisthograptis luteolata* L., and *Biston betularia* L.

The discovery of a pupa of *Gortyna flavago* Schiff. (*ochracea* Hueb.) inside a thistle stem led to an extensive search and another six were later extricated. Very few butterflies were seen on the wing, only *Aglais urticae* L., *Pararge aegeria* L. and *Coenonympha pamphilus* L. A single *Plusia gamma* L. moth was noted and one *Deuteronomos fuscantaria* Haw. was found.

The following micros were reported:—Larvae.—*Leucoptera lotella* Staint. (in leaves of lotus), *Coleophora therinella* Tengst. (on thistles), *Gracillaria stigmatella* Fab. (on willows), *Eucosma pflugiana* Haw. (in thistle stems), and *Aristotelia suffusella* Dougl. (on poplar). Imagines, *Eucosma ramella* L. and *Cacoecia podana* Scop.

The party gradually made their way over to Petts Wood station where a bus brought members back to Bromley for tea.

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HOLMBURY ST. MARY—17th September 1955.

Leader, Mr. S. WAKELY.

The weather was on its best behaviour for this fixture and those attending enjoyed a really warm sunny day amid woodlands in one of the most beautiful parts of Surrey. It was a pleasant surprise as the weather for several days previously had been showery and cold. Leaving the village green, the party took one of the paths leading towards Leith Hill and soon found an area where *Solidago virgaurea* L. (Golden Rod) was growing in abundance. Some hours were spent at this spot and many pug larvae were taken from the flowers and seed-heads of this plant. These larvae varied considerably in size, colour and markings and the general opinion was that several different species were

represented. The majority were probably the common *Eupithecia absinthiata* Clerck. The *Solidago* plants were also swarming with a species of *Aphis* which left a reddish stain on the fingers when handling the plants.

After lunch, other paths were explored and various interesting insects and plants noted. Some large clumps of an introduced shrub were seen and identified by our botanical members as *Gaultheria shallon* Pursh, a genus of plants in the order Ericaceae.

Several moths were taken, including one *Agrochola circellaris* Hufn. which dropped on to a beating tray, *Hypena proboscidalis* L. (very small specimen, probably second brood), *Dysstroma citrata* L., *Emmelina monodactylus* L., and *Eucosma solandriana* L. Larvae were fairly plentiful. In addition to the Pugs on *Solidago*, larvae of the following species were reported: *Vanessa atalanta* L. (a number on nettles by the roadside), *Notodonta ziczac* L. (a single larva on aspen), *Drepana cultraria* F. (on beech), *Bena fagana* F. (*prasinana* Auct nec L.) (common on beech), *Colocasia coryli* L. (also common on beech), *Cosymbia linearia* Hb. (on beech), *Mompha terminella* Westw. (a few in leaves of *Circaea lutetiana* L. (Enchanter's Nightshade)), and *Coleophora virgaurea* Stt. (common on Golden Rod). A number of larvae were also found under slight web on leaves of *Teucrium scorodonia* L. Some of these were subsequently bred and proved to be *Perinephela lancealis* Schiff., the foodplant of which is usually given as Hemp Agrimony (*Eupatorium cannabinum* L.).

A single specimen of the Dipteron *Phaonia basalis* Zett. was taken, and various Agromyzid larvae taken and recorded by Mr. G. C. D. Griffiths with the plants on which they occurred are as follows:—*Phytobia flavifrons* Mg. (*Melandrium rubrum* (Weig.) Garcke), *P. labiatarum* Hd. (*Teucrium scorodonia* L.), *P. posticata* Mg. (*Solidago virgaurea* L.), *Liriomyza* sp. ? *eupatorii* Kalt. (*Solidago virgaurea* L.), *L. violiphaga* Hd. (*Viola riviniana* Rehb. or *reichenbachiana* Jord.), *Phytomyza* ? *crassiseta* Zett. (*Veronica officinalis* L.), *P. virgaureae* Hg. (*Solidago virgaurea* L.). Also the following two leaf-mining Trypetids were taken: *Spilographa immaculata* Macq. (*Taraxacum* sp.), *S. spinifrons* Schroeder (*Solidago virgaurea* L.).

Tea was provided at the Royal Oak off the village green, served in a pleasant room with a case of foreign butterflies hanging on the wall—rather appropriate for an entomological gathering.

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BENFLEET—24th September 1955.

Leader, Mr. R. D. WEAL.

The few who attended this meeting were rewarded by having a fine day, and many interesting species were reported. The higher ground above the salterns was visited first, and a few larvae of *Laspeyresia funebrana* Treits. were found in fruits of the blackthorn. By gathering wild rose fruits (hips) numbers of larvae of *Laspeyresia roseticolana*

Zell. were taken, together with larvae of the Trypetid *Rhagoletis alternata* Fal. In the seed heads of the wild carrot larvae of *Laspeyresia rufillana* Westw. were found, while the seed heads of *Picris echioides* L. produced larvae of *Phalonia hybridella* Hueb.

Descending to the salterns, a few larvae of *Goniodoma limoniella* Stt. were found on the Sea Lavender. Larvae of *Cucullia asteris* Schiff. were taken on the flowers of Sea Aster, and by gathering a bagful of the same flowers numbers of larvae of *Eucosma aemulana* Schlag. were obtained, together with larval cases of *Coleophora asteris* Muhlig. (*tripoliella* Hodgk.) and crowds of the Trypetid *Paroxyna plantaginis* Hal. Larvae of *Anania nubilalis* Hueb. were once again quite common in the stems of *Artemisia vulgaris* L. In the afternoon the party were taken by one of the members in his car to Canvey Island, where a few more larvae of *Laspeyresia funebrana* Treits. were found in wild sloes. Nests of small larvae of *Euproctis chrysorrhoea* L. were also to be found, in spite of the attempts of the local authorities to wipe this species out.

General sweeping produced the beetles *Melanophthalma gibbosa* (Herbst), *Longitarsis jacobaeae* (Waterh.), *Chaetocnema concinna* (Marsh.), *Bruchus atomarius* (L.), and *Mecinus pyraeter* (Herbst) in numbers and a single specimen of *Apion ononis* Kirby. *Tychius meliloti* S. were swept sparingly from *Melilotus officinalis* Willd. *Amara convexiuscula* (Marsh.) was very common climbing the stems of *Atriplex portulacoides* L. and several pairs were taken in cop. On mud *Bembidion minimum* F. was found in plenty and a single specimen of *Leistus ferrugineus* (L.) was taken under a piece of concrete. A single Hemipteron, *Coreus marginatus* L. was reported.

Returning to Benfleet at about 4.30 p.m., a very nice tea was enjoyed at the Hoy and Helmet.

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RANMORE—2nd October 1955.

Leader, Mr. F. M. STRUTHERS.

Seven members and friends attended the meeting. The weather was generally cloudy, but fine and warm. During a few glimpses of sunshine several *Pararge aegeria* L. were seen flying in the glades also a few *Lycaena phlaeas* L. and a solitary *Vanessa atalanta* L.

Larvae were fairly plentiful and beating the beeches produced an abundant supply of the larvae of *Drepana cultraria* F., also the larvae of *Colocasia coryli* L. and *Bena fagana* F. (*prasinana* Auct nec L.). Beating oak produced larvae of *Apatele psi* L. and *Biston betularia* L. Larvae of *Cilix glaucata* Scop. were beaten from hawthorn, *Deileptenia ribeata* Clerck (*abietaria* Hübn.) from yew and a single larva of *Drepana lacertinaria* L. was obtained from birch.

The larvae of *Perizoma alchemillata* L. and *Plusia chrysitis* L. were found feeding on the Hemp Nettle (*Galeopsis tetrahit* L.) which was abundant.

The imagines of the micros *Peronea sponsana* Fabr. and *Depressaria arenella* Schiff. were seen, and larvae of the micros *Peronea schalleriana* L. (*logiana* Schiff.) were found on *Viburnum lantana*, *Mompha raschkiella* Zell. on Rosebay, *Lithocolletis sylvella* Haw. on maple and *Lithocolletis geniculella* Rag. on sycamore.

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MICKLEHAM—9th October 1955.

Leader, Mr. G. C. D. GRIFFITHS.

The weather was fine and sunny all day, but bad weather during the previous week resulted in a low attendance.

The party assembled at Boxhill station at 11.10 a.m. and proceeded to Headley Lane. The cases of *Coleophora erigerella* Ford were found commonly in the seed heads of *Erigeron acris* L. along the roadside.

On climbing the downs it was found that the vegetation was in poor condition. Larvae of *Bena fagana* F. (*prasinana* Auct nec L.) and *Colocasia coryli* L. were taken on beech.

A very pleasant walk on the downs produced nothing else of note.

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OXSHOTT—16th October 1955.

Leader, Mr. W. H. SPREADBURY.

Fifteen members and friends attended this meeting and enjoyed perfect weather. Fungi though not numerous were sufficiently frequent to maintain interest though on one occasion the foray threatened to turn into a Chestnut hunt.

About 50 species of fungus were noted, the most interesting being two Hydnums, *H. melaleucum* Fr. and *H. scrobiculatum* Fr. This latter a far from common one.

During lunch by the Black Pond ergots (sclerotia of the fungus *Claviceps purpurea* Tul.) were noted on the grass *Molinia caerulea* (L.) particularly commonly.

Those who beat for larvae found *Drepana falcatoria* (L.) and *D. lacertinaria* (L.) particularly numerous. Other larvae found were *Biston betularia* (L.), *Bena fagana* F. (*prasinana* Auct nec L.), *Apatele rumicis* (L.), *Cabera pusaria* (L.), *Notodonta dromedarius* (L.), *Drepana cultraria* (F.), *Cosymbia pendularia* (Clerck) and *Diurnea fagella* (Schiff.). Micro cases were gathered from *Juncus articulatus* L.

The dragonfly *Sympetrum danae* (Sulz.) was very abundant. A fine growth of Blue Fleabane (*Erigeron acris* L.), was found near the railway station.

During the ramble Redpolls were heard calling and Meadow Pipits were observed.

Tea was taken at the "Hut" close to the railway station.

# TRANSACTIONS

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## ABSTRACT OF EXPERIMENTAL BREEDING OF BUTTERFLIES

By Dr. C. A. CLARKE.

Read 8th June 1955.

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(1) *Maculinea arion* L. had been successfully bred in captivity during 1954. The method employed had been that of Purefoy (1915) using "walnut" nests. The type of ant used was *Myrmica rubra* L. from Cheshire. Coloured slides (Ektochrome) were shown, which gave details of the breeding.

(2) The early stages of *Maculinea alcon* Schiffermüller had also been bred, using *Myrmica ruginodis* Nyl. ants. Photographs were shown of the ants transporting the larvae. It had been noted that this occurred far more frequently with *alcon* than with *arion* and in neither species had the signalling and "humping" noted by Frohawk been seen.

(3) *Prevention of larval disease.* During 1954 while breeding Swallowtails of the *Papilio machaon* group a great deal of larval disease had been encountered. It had been found that this was bacterial in origin and not viral and cultures made from the gut and faeces of dying caterpillars had given a pure growth of *Streptococcus faecalis*, sensitive to penicillin (Professor A. W. Downie). It had next been found that fennel shoots placed in an aqueous solution of crystalline penicillin (20,000 units to the c.c.) took up the penicillin and the antibiotic could be obtained in high concentration from the leaves. Further caterpillars fed on fennel so treated excreted penicillin in the frass. It seemed, therefore, that these findings might be utilized to prevent certain forms of larval disease, and work on it was still in progress with Professor Downie in the Bacteriological Laboratories, Liverpool University.

(4) A resumé was given of the hybridisation studies which had been made between members of the *machaon* complex of butterflies both in the Old and New World. Using the method of hand-mating it had been found possible to cross most of the forms but the hybrids had always been infertile inter se. Backcrosses had, however, been frequently obtained and this had enabled some preliminary work on the genetics of the *machaon* group to be done. Details were given of the method of inheritance of the ground colour, sexual dimorphism and larval spot colour in *P. machaon*, *P. asterias* F. and *P. brevicauda* Saund. The latest hybrid to be obtained was that between *P. machaon* and *P. hospiton* Gén. and living larvae of the cross were shown. These showed marked irregularity of the black bands with castellations giving the appearance of an anteroposterior stripe. The larvae were very similar to those which



had been obtained in 1954 between *P. machaon* and *P. machaon saharae* Oberth. from North Africa. Mention was also made of the hybrids between *P. machaon* and *P. machaon hippocrates* Felder. from Japan. In this cross there had been a marked upset in the sex ratio, very few females having been produced. This finding may be related to the fact that the chromosome number in *hippocrates* is said to be different from that in *machaon*.

Taking the information about the hybrids as a whole it can be inferred from their fertility that the various forms are genetically fairly distinct and must be considered as at least extreme subspecies. Whether hybrids such as have been obtained in captivity occur in nature is uncertain but spontaneous matings have been observed between some of the forms and undoubtedly it could occur in hybrid zones. An expedition was investigating this point in Colorado during the present Summer.

In general it was considered that the *machaon* group provided some of the most suitable material ever investigated in animals for studying processes of speciation in detail, taking into account genetic, ecological and behaviour differences as well as time. However, the work would also be of value in the study of evolution if the time at which the various forms originally became isolated could be established; it would then be possible to get a good estimate of the speed at which divergence had occurred in terms of genetic differences.



## A LIST OF THE MACROLEPIDOPTERA AND PYRALIDINA OF NORTH WEST SURREY

By R. F. BRETHERTON, C.B., M.A., F.R.E.S.

### INTRODUCTION.

Although Surrey has probably for long contained more resident collectors of Lepidoptera than any county, and is continually being visited from London, there is remarkably little assembled information about its butterflies and moths. This is particularly true of the north-west corner of the county. The Victoria County History list, prepared by H. Goss and C. G. Barrett, was published in 1902 and has not been revised. It was based on records from a limited number of places only, and notably contains hardly anything about the north west. Early references to this district are contained in some notes on collecting around Chertsey which were written by A. H. Clarke for various periodicals between 1863 and 1867. But he gave no exact localities, and some of his identifications are suspect. H. G. Champion in a series of articles in the *Entomologist's Monthly Magazine* between 1907 and 1912 listed a number of species which he and his brother, R. J. Champion, had found around Horsell and Woking; many of their captures are preserved in the Hope Collection in the University Museum, Oxford. There are scattered records in other periodicals, as well as useful reports of insects seen at Byfleet and elsewhere during field meetings of the South London Entomological and Natural History Society over a number of years. Baron de Worms' survey of the Butterflies and Moths of London and its Surroundings, now appearing in "The London Naturalist", touches at its fringes Walton-on-Thames, Weybridge and Chertsey.

It is the aim of my own paper to provide an up-to-date summary of the Macro-Lepidoptera and Pyralidina of the north-western corner of the County. Arbitrary limits for a study of this kind are unavoidable. The area here chosen is that part of Surrey which is bounded on the east and south by the main Southern Region railway line from Walton-on-Thames through Woking to (but excluding) the outskirts of Guildford, and thence by the branch line to Ash Vale, and on the west and north by the borders of Hampshire, Berkshire, and Middlesex. This is an area of about 100 square miles. Most of it lies below the 200 foot contour, and only on Chobham Ridges does it exceed 400 feet. Geologically, the core of it consists of Bagshot, Bracklesham and Barton Sands of varying degrees of sterility, topped here and there with Plateau gravels and pebblebeds. There are narrow belts of alluvium, mostly also light, along the Thames and the lower courses of the two Bournes, the Wey and the Blackwater; and there are some small patches of London Clay and flood-plain gravels near Egham and south of Walton-on-Thames. Calcareous soil is completely lacking, the nearest outcrops—the Hog's Back and the North Downs to the south

and south east, and the knob of Windsor Castle to the north west—being well outside the boundaries chosen.

Because of the general poverty of its soil the District was a century ago very thinly populated. There were a few ancient towns and villages, such as Chertsey, Chobham and Pirbright, with some arable and meadow land around them; but for the most part the land was open heath, with a thin cover of heather, gorse and small birches and, in the wetter places, scrub oak, sallow and alder. There was also reed and marsh vegetation along the Thames, which had spread, too, beside the course of the Basingstoke Canal. Though we have no records of it, it seems likely that the indigenous lepidoptera lacked variety. In the latter half of the last Century came much enclosure and the building of large country houses, mainly on the least sterile Bagshot Beds, and with this, extensive planting and protection of woods. It is mainly to this that we owe the fine groves of oak, large birch, Scots pine, and occasionally beech and hornbeam which, albeit depleted by wartime fellings, now provide the richest breeding grounds for insects. Moreover, the Scots pine, once introduced, proved able to establish itself naturally on the remaining heaths, and to-day it is only prevented by frequent fires from changing large areas into coniferous forest. Later still began the process of suburbanisation, which is still proceeding at an ever accelerating rate. So far, it too has probably enriched rather than impoverished the fauna, since it has brought with it garden plants and bushes to nourish many new settlers—without, as yet, covering enough ground to cause the extinction of many indigenous species. There is little arable land, and even to-day heath, rough pasture and woodland occupy about half of the total area. In recent years more and more of the open country has been used for army training grounds and ranges. In some places these provide a kind of nature reserve, excluding the builder and the agricultural improver as well as the naturalist; but only too often these uses lead to destruction of the heather and erosion of the soil, as has happened on a large part of Chobham Common during and since the late war.

Apart from the published information already mentioned, most of the material for this list has been assembled by the author with the help of a number of entomologists who live in the area, and also of others who have collected here from time to time. Searching, sugaring, larva hunting, and work with light and sheet in the field have been by no means neglected. But the most productive source of information has been systematic light-trapping, particularly at five traps for which records have been kept over substantial parts of the period from 1946 to 1955. A full list of those who have contributed material, together with the main centres of their observations, is given at the end of this Introduction, and the places named are shown on the sketch-map (page 96). The eastern and northern parts of the District have been more regularly worked than the west; but the results of field collecting there, and the general ecology, suggest that not many species are likely to have been missed on that account.



The value and use made of the light-trap data requires some elaboration. The traps themselves are in rather varied situations. That operated by the author at Ottershaw is surrounded by gardens and orchards, with woods and a small amount of heather within a quarter of a mile. Mr. Best's trap at New Haw is in a similar situation, but has the advantage of being near to the rich vegetation along the Basingstoke Canal. Mr Messenger's at Oatlands is on a more open site, looking out to the north over a wide expanse of Thames meadows where, as his records show, many of the indigenous marsh insects still maintain a foothold in patches of reeds and overgrown ditches. Those operated by Baron de Worms at Horsell and Mr. Lawson at Pirbright are near the edges of the heath country. The range of species attracted to the five traps is surprisingly similar, and even the differences in the relative abundance of species is less than might have been expected from the contrasts between their immediate environments.

It is now generally accepted that the distance from which a moth can be "attracted" to light is quite small. Even for mercury vapour lamps of 80 or 125 watts, such as we have been using in the last four seasons, it must enter a radius which is probably not greater than 100 yards (Robinson, 1952). Moreover, the attractive power is smaller for some species than others, and some species do not easily enter traps of the cone pattern even when they are attracted by their lamps. It might, therefore, be feared that a mere five traps, even somewhat variously situated, would provide a very inadequate means of testing the presence and abundance of particular species in a district as large as that considered here. One would suppose that many of the more local species would be missed altogether, and that the abundance of particular species recorded in each trap would be decisively affected by the presence or absence of breeding grounds for them in the very near neighbourhood. But on the whole, our researches do not bear out such fears. Only a dozen of all the night-flying Macro-lepidoptera recorded from the whole District have failed to appear at one or other of these five traps; few species which have been recorded in substantial numbers at one trap have been absent from any of the others; and there are not many really large differences in the frequencies with which particular species are observed at the different traps. One can only guess at the reasons for this rather surprising result. In a generally rather uniform area, it may be that the foodplants and breeding grounds are in fact more widely distributed than we suspect. It is also very probable that at any rate the larger moths move in their nocturnal flights much farther and more freely from their breeding grounds than is generally assumed. Whatever the explanation, our actual experience gives us some confidence that systematic light-trapping can in fact be used as a satisfactory way of discovering the presence and assessing the abundance of the larger moths over a very wide area round the traps themselves. Obviously, this is not true of butterflies or mainly diurnal moths, and care is certainly needed in using light-trap results to generalise about the smaller Geometers and Pyralidina; nor, certainly,

is it an excuse for neglecting field-work. But it seems to the author to justify the heavy emphasis which is given to light-trap records in the List which follows.

Records have been kept of all the Macro-Lepidoptera—more than 130,000—which have attended the Ottershaw trap from 1946 to 1955, and the Horsell trap—about 64,000—from 1952 to 1955. The relative frequencies of the various species at each trap have been assessed and defined on the following scale:—

Less than 1 in 10,000 .....	(less than 0.01%)	very scarce
1 in 10,000 to 1 in 3,200 .....	(0.01 to 0.03%)	scarce
1 in 3,200 to 1 in 1,000 .....	(0.03 to 0.1%)	fairly common
1 in 1,000 to 1 in 320 .....	(0.1 to 0.31%)	common
1 in 320 to 1 in 100 .....	(0.31 to 1.0%)	very common
1 in 100 to 1 in 32 .....	(1.0 to 3.1%)	abundant
More than 1 in 32 .....	(3.1% upwards)	dominant

A detailed count of Macros was available for the New Haw trap for the years 1947/9 (before the use of mercury vapour bulbs) and the scale has been applied arithmetically to this also, but the results have been adjusted in certain cases to cover changes in later years. For the other traps no detailed counts were kept except for the rarer species, but frequencies have been *estimated* on the same scale by the operators. In general, the frequencies given in the list for particular species represent an average of years, but some of the most striking annual differences have been noted.

For the Pyralidina, an assessment of frequency at Ottershaw, based on a count of about 11,000 moths, has been supplemented by records of most of the species which have attended the Oatlands light trap, by observations made by Mr. H. J. G. Stroyan and Mr. S. Wakely at Sheerwater, and by field work in several other parts of the District. But much more work is still required before a really satisfactory picture can be obtained of the prevalence of members of this group of moths.

Analysis of the moth-trap counts at Ottershaw and Horsell (given in greater detail in the Appendix) shows that about one-third of the totals is accounted for by six or seven "dominant" species—*Amathes c-nigrum* Linn., *Agrotis exclamationis* Linn., *Triphaena pronuba* Linn., *Apamea monoglypha* Hufn., *Orthosia stabilis* View., *O. gothica* Linn., *Lycophotia varia* Vill. (the last being unusually numerous in 1954 and 1955). If another score of "abundant" species are added, the proportion covered approaches 60%. At the other end of the scale, for each trap about 130 species which are "very scarce" or have occurred only singly provide less than  $\frac{1}{2}$ % of the total attendance, and another 75 "scarce" ones less than another  $1\frac{1}{2}$ %. These results of course exaggerate the real dominance and scarcity of these species in the District as a whole, both because the traps are themselves somewhat selective for certain species, and because the balance of species is certainly rather different in other places where traps have not been

operated. Nevertheless, our information from trapping and field collecting, taken as a whole, suggests that perhaps thirty or forty species may provide half of the population of Macro-lepidoptera in the whole District; while half the number of species which exist in it may account for less than 5% of the total numbers. Some of these rarer species may be locally common in environments which suit them, but more seem to exist in low densities more or less all over the District. The population structure may be likened to that of a sandwich with many layers of varying thickness, topped with a sprinkling of very scattered tit-bits. There is also certainly continuous movement into the District, by the recognised migrant species, by species which are generally extending their range, and by short-distance strays from adjoining areas: some of these may establish themselves and become more or less common, as five or six species are known to have done in the past ten years. Finally, one must note that there are wide fluctuations over the years in the abundance even of the common residents. Apart from seasonal and annual variations which are often clearly attributable to weather conditions, there are certainly longer cycles for many species. For example, *Dasychira fascelina* Linn. and *Lycophotia varia* Vill. have built up from comparative scarcity to abundance over the past four or five years, while others, like *Callimorpha jacobaeae* Linn. and *Selenia tetralunaria* Hufn. have steadily declined.

A total of 577 species of Macro-lepidoptera (as defined in "South") has so far been recorded from the District, and to this can be added 99 species of Pyrales and Plume Moths: undoubtedly the list is much less complete for these than for the Macros. Included in these totals are a score of species which are irregular immigrants from the Continent. These have no claim to be regular inhabitants of the District, though some of them have visited it in several different years and a few have certainly completed at least one life cycle here. Thus *Colias hyale* Linn., *Nymphalis antiopa* Linn., *Herse convolvuli* Linn., *Celerio galii* Rott., *Daphnis nerii* Linn., *Eurois occulta* Linn., *Leucania vitellina* Hübn., *L. albipuncta* Fabr., *Lithomoia solidaginis* Hübn., *Heliothis armigera* Hübn., *Eublemma parva* Hübn., *Plusia acuta* Walker, *Itame fulvaria* Vill., *Dioryctria splendidella* H.-S. and *Palpita unionalis* Hübn. have been seen only as adults. *Heliothis peltigera* Schiff. has been found both as larva and moth. *Acherontia atropos* Linn. has been found several times in the larval state and bred, though the moth has not been taken in the wild. For *Colias croceus* Fourc., *Laphygma exigua* Hübn., *Rhodomestra sacraria* Linn., and *Nyctosia obstipata* Fabr. the pattern of the records makes it almost certain that they have bred here, though the earlier stages have not been detected.

Apart from these irregular immigrants another two dozen species are probably occasional visitors to the District rather than residents. *Lysandra coridon* Poda, *Setina irrorella* Linn., *Agrotis cinerea* Hübn., *Hadena conspersa* Esp., *Eremobia ochroleuca* Esp., *Oria musculosa* Hübn., *Acontia luctuosa* Esp., *Scopula ornata* Scop., *Ortholitha*

*bipunctaria* Schiff., *Melanthia procellata* Fabr., *Aspitates gilvaria* Fabr., *Pempelia dilutella* Hübn., *Hypochalcia ahenella* Schiff., and *Pyrausta cespitalis* Schiff. are mere stragglers from the chalk downs a few miles away; and *Leucoma salicis* Linn., *Eilema deplana* Esp., *Cucullia asteris* Schiff., *Heliothis dipsacea* Linn., *Hapalotis venustula* Hübn., *Scopula marginepunctata* Goeze, *Abraxas sylvata* Scop., *Aspitates ochrearia* Ross., *Alispe angustella* Hübn. and *Lorostege palealis* Schiff. are probably only casual visitors. Besides these, for some two dozen Macros and a dozen Pyrales we have at present only three firm records or less. Most of these species, which include such interesting insects as *Apatura iris* Linn., *Apatele alni* Linn. and *Hydraecia petasitis* Doubleday, may have been merely overlooked here, because of their retiring habits, extreme localisation, or resemblance to other species. Finally, there are nine species—*Papilio machaon* Linn., *Strymonidia w-album* Knoch, *Amathes stigmatica* Hübn., *A. agathina* Dup., *Schrankia taenialis* Hübn., *Mesotype virgata* Rott., *Cepphis advenaria* Hübn., *Cleora lichenaria* Hufn., and *Pyrausta stachydalis* Zinck.—which have not been seen here for more than a quarter of a century: some of them may await rediscovery.

If the immigrant, stray, and possibly extinct species are discounted, known residents in the District at the present time account for about 530 species of Macros and 91 Pyralidina, as against about 785 and 188 for the whole of the British Isles, after similar exclusions have been made. Considering the lack of variety in the geology and flora of the District, this is a surprisingly large proportion, and it compares quite respectably with the resources of other districts in Southern England.

The list of lepidoptera occurring within six miles of Haslemere, revised by Mr. F. A. Oldaker up to 1951 on the basis of steady recording since the time of C. G. Barrett, includes 562 Macros and 94 Pyrales and Plume Moths, of which about 25 can be discounted as non-resident or probably extinct. This covers an area of about the same size as our own but more varied, in that it contains, besides the high heathery moorland of Hindhead, on the Lower Greensand, much dense woodland growing on the Wealden clay; and it has been also less disturbed by suburban development. Its permanent residents include about 40 Macros and a dozen Pyralidina which are not known from our own area, but it also lacks many which are found here.

The list of Macro-Lepidoptera of the Oxford District (1939, with Supplements to 1947) covers an area of about 330 square miles which, though much more varied, differs sharply from our own District in that it contains hardly any heather country but much calcareous soil. The Oxford list includes 539 species certainly recorded, of which 38 have not been noted at all in North West Surrey. The Pyrales and Plume Moths for the same District (1928, with a few known additions) number 88 species, of which a dozen are not known here. The greater length of the North West Surrey List is mainly due to the inclusion of more migrant and coastal species, which seldom penetrate as far as Oxford,



though it must be noted that the Oxford Lists (like that for Haslemere) were compiled before the days of mercury vapour lamps, and a number of casual and vagrant species could probably be added to them with this help to-day.

North West Surrey is not good butterfly country, because of the absence of flowery downland and of thick woodland on heavy soil, which are the favoured haunts of so many of the British species. This List does, it is true, include a respectable total of 44 butterflies, of which 38 are probably permanent residents or regular immigrants. But a third of these must be described as scarce or very local, and few of the commoner species appear in really large numbers. *Eumenis semele* Linn. and *Plebejus argus* Linn. are characteristic of the heaths and sometimes locally abundant. *Limenitis camilla* Linn. is established and fairly common in the thicker woods; the earliest record for the District seems to be 1929. *Nymphalis polychloros* Linn. has been seen at Worplesdon, several times near Chobham and once at Weybridge, and is probably resident. There are several small colonies of *Euphydryas aurinia* Rott., mainly in the south-west and centre. *Pararge aegeria* Linn., *Maniola tithonus* Linn. and *Celastrina argiolus* Linn. are general and notably numerous.

Among the moths there are several specialities. *Parascotia fuliginaria* Linn. was regarded as one of the rarest of the British moths until its larvae were discovered by Mr. E. E. Green in 1931, feeding upon the fungus *Polystichtus versicolor* growing in his garden near Camberley, just outside our District, where a few moths had been taken in earlier years. When this discovery was followed up, the species was detected in many other places on the Bagshot Sands, and it is clear that it occurs throughout the District wherever rotten logs with suitable fungi growing on them are available. Fellings and damage to woodlands during the late war increased the supply of these and were no doubt helpful to the moth: certainly it was very numerous from 1946 to 1950 but is now becoming harder to find as the woods are tidied up. I have found larvae on several kinds of fungi, growing on Scots pine and beech as well as on birch. The moth comes readily to the light-traps, and I have twice found it at sugar and have once caught it flying quietly about at midnight. Though there are stray records from the London Docks, as well as from other parts of England, it is not certainly known to be established off the Bagshot Sands, and the District is at the centre of its British distribution.

*Dasycampa rubiginea* Fabr. is another of the District's specialities. It seems to be spread through the whole area, and can be taken at sugar, ivy, willow, and plum blossom, as well as at light, though always in small numbers. Though in captivity the larvae will eat almost anything and are easy to rear, their natural foodplant and habits are unknown, and it may be that, when these are discovered, the species will prove to be commoner than it now appears to be.

Notable species occurring on the heaths are *Dasychira fascelina* Linn., whose larvae often swarm on the heather but are very difficult



to breed through, *Agrotis vestigialis* Rott., *Heliothis maritima* Graslin, *Eustrotia uncula* Clerck., *Tholomiges turfosalis* Wocke., *Sterrhia muricata* Hufn., and *Chlorissa viridata* Linn. (both very local), *Chesias rufata* Linn., *Gnophos obscurata* Schiff., *Selidosema plumaria* Schiff., and, much less commonly, *Dyscia fagaria* Thb. There are also some interesting Pyralidina, including the Plume, *Trichoptilus paludum* Zell. on the sundew, *Myelois neophanes* Durrant on fungi growing on burnt stems of gorse and birch, *Salebria betulae* Goeze, *Luodamia fusca* Haw, *Nephopterix palumbella* Fabr., and the Grass Moths *Crambus uliginosellus* Zell., *C. dumetellus* Hübn. (recorded by Champion in 1910/1 but only once seen recently), *C. hamellus* Thb., *C. latistrius* Haw. *C. contaminellus* Hübn. has so far only been noticed in small numbers at the Ottershaw light-trap and near Ash Vale, but its headquarters are probably on the heaths.

In the woods, *Odontosia carmelita* Esp. probably exists wherever there are large birches, but is elusive and seldom seen; *Apatele leporina* Linn. and *Polia tinctoria* Brahm. are common, the larvae of the latter being most easily found on small bushes after dark. *Dicycla oo* Linn. comes to sugar and light in numbers among old oak trees, which also produce the rare Phycid *Nephopterix similella* G. & Z. *Euphyia picata* Hübn. has been taken on the edges of heaths, but is very scarce. *Apamea scolopacina* Esp. comes freely to light in some places, and has been taken on ragwort bloom and at sugar. *Mythimna turca* Linn. has been found in several places, but is certainly scarce.

One of the most interesting features is the presence in the District of many marshland species, albeit in small numbers. A century ago there must have been many fens and reed-beds along the course of the Thames. Only remnants, often but a few yards square, still exist there and along the course of the Basingstoke Canal and the Chobham Bourne, but they are enough to provide a refuge for a very interesting fauna. This includes the Wainscots *Nonagria geminipuncta* Haw., *N. dissoluta* Treits., *Chilodes maritima* Tausch., *Arenostola pygmina* Haw., *A. phragmitidis* Hübn., *Rhizedra lutosus* Hübn., *Leucania straminea* Tr., *L. pudorina* Tr. (which also occurs on the heaths), *L. obsoleta* Hübn., and other marsh lovers such as *Earias clorana* Linn., *Spilosoma urticae* Esp., *Comacla senex* Hübn., *Apamea ophiogramma* Esp., *Celaena leucostigma* Hübn., *Eupithecia valerianata* Hübn., and all the water Pyrales. Unfortunately the destruction of their remaining haunts continues apace; one of the richest sites on the Basingstoke Canal has been turned into a housing estate in the last three years, and reckless felling of old poplars by the Thames bids fair to wipe out *Cirrhia ocellaris* Bork. and other good species which depend upon them.

Several other species of restricted habitat are rather surprisingly established in the area. *Heliothobus albicollis* Hübn., and *Procytus literosus* Haw., which are usually coastal species, come regularly in small numbers to the light traps; and *Eupithecia arceuthata* Frey., usually associated with juniper on the chalk downs, breeds in abundance at Ottershaw on a hedge of *Cupressus lawsoniana*. Most of the *Clematis-*

feeding species also occur, having established themselves on cultivated varieties in gardens and on the few scattered plants by the roadsides.

Finally, we must notice four species which are certainly new arrivals in the District. *Hyloicus pinastri* Linn. has been extending its range north-east from Dorset for nearly twenty years. It was breeding nearby at Wisley in 1946, was first observed in the District in 1948, and is now widespread and fairly common on Scots pine. *Caradrina ambigua* Fabr. was until recently confined in Britain to the South Coast, and was there thought to be maintained largely by recurrent immigrations. In August, 1949, however, it appeared commonly on several of the heaths and at light in this District, and proceeded to maintain and indeed to extend its foothold. It has occurred annually since then—a small brood in early summer followed by a much more numerous emergence in August and September; but it suffered from the cold summer of 1954 and the cold winter which followed, and very few were seen in 1955. *Pyrausta nubilalis* Hübn., once regarded as a scarce immigrant, seems to have established itself in Essex some years ago and then spread widely over south-eastern England. A few were seen for the first time in the District at Oatlands in 1952, and one at Ottershaw. It then became commoner each year and in 1955 was widespread. Its larvae have not yet been detected here. Finally, one example of *Cucullia absinthii* Linn., which is known to be spreading rapidly from its accustomed haunts on the south and west coasts, came into Oatlands light trap in July, 1954; and in 1955 there were five. Some examination of the local *Artemisium vulgare* Linn. has not yet revealed any larvae here, as it has done not very far away; but the species may be presumed to be establishing itself in the District.

It remains to mention certain usually common species whose absence or rarity in this District is remarkable. In spite of the abundance of birch *Eulype hastata* Linn. and *Anaplectoides prasina* Fabr. have only been noticed twice. There is plenty of aspen: yet there is but one record of *Tethea* or Fabr., and *Brephos notha* Hübn. is very local and rare. Among the pine-feeding species, *Thera firmata* Hübn. and *T. variata* Schiff. are barely recorded, though their close relative *T. obeliscata* Hübn. swarms. Elms are not numerous here, and *Cosmia affinis* Linn. and *C. diffinis* Linn. are correspondingly scarce: but their place is taken commonly by *C. pyralina* View., elsewhere usually also an elm feeder but much scarcer than its cousins; here it probably uses an alternative food-plant. Among usually abundant polyphagous species we may note that *Abraxas grossulariata* Linn. is almost unknown except on the northern fringes of the District, and *Cerapteryx graminis* Linn., in most places a pest of grassland, is here very rare. Of *Colostygia didymata* Linn. there are only two records.

#### SCOPE AND NOMENCLATURE

The List which follows covers the Butterflies and the larger moths (Macro-Lepidoptera), as contained in South's "British Butterflies" and

“British Moths”, and the Pyrales and Plume Moths (Pyralidina) as defined in Beirne’s recent book on the subject. This traditional, if unscientific, scope has been dictated by the limitations of the material available; even so, this study of the District’s Pyralidina is necessarily slighter than that for the other groups. A list of the remaining “Micros”—Tortrices, Tineides, Nepticulides, Micropteryges, and Psychidae—must unfortunately wait until much more work has been done on them and until a competent specialist can undertake its compilation.

The scientific nomenclature and order followed are those of I. R. P. Heslop, “Indexed Check-List of the British Lepidoptera”, 2nd edition, 1947, by reference to which the English equivalents of the scientific names can be obtained if required. The terminology and arrangement of this Check-List are now somewhat out-of-date; but the advantages of using a single and familiar list are felt much to outweigh the doubtful benefits of trying to introduce the latest—and still very unstable—findings of the addicts of name research. For the Pyralidina, the nomenclature used by Beirne has been followed.

For each species, its frequency at the light-traps is given first, assessed on the scale which was explained earlier. Where a range of frequencies is given, that mentioned first represents experience at a majority of traps. Information about distribution in the rest of the District follows, as far as possible in the order north west to north east, centre, south east, south west. Exact dates and recorders’ names are given only in the case of scarce species or for some other special reason. If more than one brood occurs, this is stated; and mention is made of aberrational forms, unusual foodplants, and other points of special interest. No species have been included about whose occurrence in the District any doubt exists: the names of a few of which the only records date from before 1930 have been placed within brackets ( ). A summary Census of Species at the end distinguishes the numbers which are now resident in the District from those which are probably only of ancient, irregular, or casual occurrence here, and gives a comparison with the numbers which occur as residents and regular immigrants in the British Isles generally.

A sketch-map of the District, showing the main localities referred to, is also attached.

In conclusion, I must express my deep sense of gratitude to the recorders, named below, who have so generously and patiently supplied me with information and answered my questions, and to others who have helped me with encouragement and practical advice. Studies of this kind can only be adequately made by co-operative effort, and it is a tribute to the keenness and scientific spirit of modern collectors of lepidoptera that so much help has been forthcoming for so small an area. I also thank the Council of the South London Entomological and Natural History Society for the readiness with which they have undertaken the task of publication.

## LIST OF ABBREVIATIONS

Names of Recorders, with the centres to which their records mainly refer.

Best, A. A.	A.A.B.	New Haw, mainly 1947/53
Bretherton, R. F.	R.F.B.	Ottershaw and north central part of the District, 1946/55
Champion, H. G. and R. J.	H.G.C. R.J.C.	Horsell, Chobham, Woking, 1906/13
Classey, E. W.	E.W.C.	Ash Vale, 1940/46
Clarke, A. H.	A.H.C.	Chertsey, 1863/67
Ellison, R. E.	R.E.E.	Horsell, 1948/50
Fairclough, R.	R.F.	Weybridge, Chobham, Camberley, Ash Vale, visits 1950/5
Heslop, I. R. P.	I.R.P.H.	Bisley
Lawson, H. B.	H.B.L.	Pirbright, 1938/55
Messenger, J. L.	J.L.M.	Oatlands and Weybridge area, before 1939 and 1950/5
Parfitt, R. W.	R.W.P.	Bagshot, Frimley and south west of the District, 1942/50
Parsons, R.E.R.	R.E.R.P.	Ottershaw, south side
Pierce, C. W.	C.W.P.	Wentworth, Longcross, by day 1945/55
Showler, A. J.	A.J.S.	Cobbett Hill, 1955
Stroyan, H. J. G.	H.G.S.	Sheerwater, 1932/47
Trundell, E. E. J.	E.J.T.	Hook Heath, 1955
Wakely, S.	S.W.	Sheerwater, visits 1954/55
Wild, E. H.	E.H.W.	Chobham Common, visits 1952
de Worms, Baron C. G. C.deW.		Milton Park, Egham, 1928/48; Horsell, 1945/55

## PUBLICATIONS AND COLLECTION REFERRED TO

- Ent. Gaz.* Entomologist's Gazette.  
*Ent.* The Entomologist.  
*E.M.M.* Entomologist's Monthly Magazine.  
*Ent. Rec.* Entomologist's Record and Journal of Variation.  
*Ent. Ann.* Entomologist's Annual.  
*E.W.I.* Entomologist's Weekly Intelligencer.  
*Week. Ent.* Weekly Entomologist.  
*S.L.E.S.* Proceedings and Transactions of the South London Entomological and Natural History Society (field meetings at Woking, Byfleet, Ash Vale, Horsell).  
*V.C.H.* The Victoria County History of Surrey, vol. I (1902): 109/150. Lepidoptera, by Herbert Goss and Charles G. Barrett.  
*Haslemere List.* A List of the Lepidoptera occurring within Six Miles of Haslemere: revised edition compiled by F. A. Oldaker, M.A., 1951 (*Haslemere Natural History Society Science*, Paper No. 5).

*Oxford Lists.* A List of the Macro-Lepidoptera of the Oxford District, by R. F. Bretherton, M.A., 1939, with Supplement, 1940, and Second Supplement, by A. M. Emmet, M.B.E., M.A., 1948 (*Proc. Ash. Nat. Hist. Soc. Ox.*); A List of the Micro-Lepidoptera of the Oxford District, by E. G. R. Waters, M.A., F.E.S., 1928 (*Proc. Ash. Nat. Hist. Soc. Ox.*).

*The Butterflies and Moths of London and its Surroundings*, by C. G. de Worms, M.A., Ph.D., F.R.I.C., F.R.E.S. (*London Naturalist*, 1949: 46/80, 1953; 101/146, 1954: 66/107).

*O.U.M.* The Oxford University Museum Collections.

## PAPILIONES.

### PAPILIONIDAE.

(*Papilio machaon* Linn.) Windlesham, a nearly full-fed larva found last week in June 1798, which emerged on 10th August (transcription from Dr. Abbott's Entomological Calendar in the MS. Journal of J. C. Dale, now in the University Museum, Oxford). There is no reason to doubt this record, as there is other evidence that *P. machaon* was resident in south-east England at that period.

### PIERIDAE.

*Pieris brassicae* Linn. Common generally in fields and gardens. Two broods.

*P. rapae* Linn. Very common in fields and gardens. Three broods in 1947, 1949, 1952.

*P. napi* Linn. Occurs on the heaths as well as elsewhere, but is less common than the two previous species. Two broods.

*Euchloë cardamines* Linn. Well distributed and locally common.

*Colias hyale* Linn. Three records only, a scarce immigrant. 1947: Ottershaw, one male in an overgrown field, 14.ix; Walton-on-Thames, 4.x. 1949: Walton-on-Thames, 27.viii.

*C. croceus* Fourcroy. An irregular immigrant. Abundant in 1947, common in 1949: certainly bred in the District in both years. f. *helice* Hübner at Walton-on-Thames, 18.x.47, and Ottershaw, 15 and 28.viii.49: from one of the latter a gynandrous specimen was bred with three wings normal but left forewing of f. *helice* (R.E.R.P.).

*Gonepteryx rhamni* Linn. Well distributed and fairly common. Sheerwater, larvae on *Alnus frangula* Linn., 1939 (H.G.S.).

### NYMPHALIDAE.

*Argynnis paphia* Linn. Scarce. Wentworth (C.W.P.), one in 1947, two in 1950; Ottershaw, 3.viii.46, 12.vii.47 (R.F.B.); near Chobham, 1950 (R.E.R.P.); Sheerwater, occasional only (H.G.S.); Ash Vale, very local (R.W.P.).

*A. adippe* Linn. Very scarce. Wentworth, one 1945, three 1948 (C.W.P.); Sheerwater, two females viii.1934 (H.G.S.).

*A. aglaia* Linn. Local, usually scarce. Wentworth, often common (C.W.P.); Ottershaw, one worn female 1949 (R.E.R.P.); Sheerwater, one female 30.vii.34 (H.G.S.); Ash Vale, very local (R.W.P.).

- A. euphrosyne* Linn. Local, not common. Wentworth, a few 1946 and 1947; Ottershaw, one female 1950; Stanner's Hill, a small colony; Sheerwater; Ash Vale.
- A. selene* Schiff. Local, usually in bogs on the heaths. Wentworth; Chobham Common; Sheerwater; Clasford Common, a small colony in 1945/6. The usual foodplant here appears to be *Viola palustris* Linn.
- Euphydryas aurinia* Rott. Very local, mainly in the south-west. Longcross, one in 1950 (C.W.P.); Stanner's Hill, one male 30.v.50 (R.F.B.): a very small colony existed nearby at Fairoaks Aerodrome on ground since ploughed up (R.E.R.P.); Lucas Green, a strong colony 1955 (R.F.B.); Littlefield Common, larvae 1950, adults 1955 (R.E.R.P., A.J.S.); Clasford Common, small colony 1945/6 (R.W.P.); Frimley, near Tomlin's Pond (R.W.P.).
- Polygonia c-album* Linn. Well distributed and fairly common. The partial first brood of f. *hutchinsoni* Robson is seldom seen.
- Aglais urticae* Linn. General, sometimes abundant. Two broods.
- Nymphalis polychloros* Linn. Very scarce, perhaps not resident in the District. Weybridge station, one seen in spring 1949; Chobham, several times (C.W.P.); Worplesdon Hill, one in a garden 12.iv.47 (J. Howell: *Ent.*, **80**: 164).
- N. antiopa* Linn. A scarce vagrant: seven records only. 1858, Weybridge, one taken 6.x and another seen on the following day (A. F. Pennell: *E.W.I.*, **5**: 26). 1875: St Anne's Hill, 10.viii (Wailly, *Ent.*, **8**: 197). 1910: Weybridge, 5.iii (E. Parker, *Ent.*, **43**: 119). 1929: Virginia Water, 13.viii (*Ent.*, **63**: 14). 1930: Egham, 8.iii (*Ent.*, **63**: 163). 1943: Sheerwater, one seen by a neighbour 4.viii (H.G.S.).
- N. io* Linn. Common generally.
- Vanessa cardui* Linn. Immigrant, appearing in most years, sometimes abundant.
- V. atalanta* Linn. Immigrant, commoner and more regular than the last species. Once in Oatlands light-trap.
- Limenitis camilla* Linn. Fairly common in the thicker woods. Wentworth; Longcross; Butts Wood; Sheerwater; near Fairoaks Aerodrome, larvae v.54 (R.E.R.P.). The first record is Byfleet 8.vii.29.
- Apatura iris* Linn. Two records only, but perhaps overlooked. Sheerwater, a male taken in a greenhouse (Dr. H. G. Baynes: *The Times*, 15.vii.36); Pirbright, a female dead in a spider's web at the post office 24.vii.38 (H.B.L.).

#### SATYRIDAE.

- Pararge aegeria* Linn. General, and common in woods and gardens. Two broods. Once in Ottershaw light-trap.
- P. megera* Linn. General, only fairly common. Sheerwater, ab. *xanthos* 7.ix.41 (H.G.S.).

- Eumenis semele* Linn. Very common on all the heaths; occasionally strays to buddleia blossom in gardens at Ottershaw and Oatlands.
- Maniola jurtina* Linn. General and common. Once in Oatlands light-trap.
- M. tithonus* Linn. Generally common near the heaths, but scarce at Walton-on-Thames and Weybridge.
- Aphantopus hyperantus* Linn. Very local, but common where found. Longcross; Brox and Anningsley Park, in wet fields; Sheerwater; Ash Vale.
- Coenonympha pamphilus* Linn. General and very common, in two broods.

#### LYCAENIDAE.

- Thecla quercus* Linn. Locally common. Callow Hill; Ottershaw, once in the garden; Longcross; Sheerwater; Butts Wood, larvae common; Ash Vale.
- (*Strymonidia w-album* Knoch.) Chertsey, one on bramble blossom by the roadside, 17.vii.1864 (A.H.C.: *E.M.M.*, 1: 192). No later record. The preferred food-plant, wych elm, is very scarce here now.
- Callophrys rubi* Linn. Local near heaths, seldom common. Longcross; Sheerwater; Chobham Common; Ash Vale.
- Lycaena phlaeas* Linn. General and common. Two broods only noticed.
- Plebejus argus* Linn. Locally abundant in many places on the heaths. Sheerwater; Horsell; Chobham Clump; Ash Vale. A blue female, possibly an intersex, taken at Chobham Clump 10.vii.55 (R.F.B.).
- Aricia agestis* Schiff. Very local. Egham, quite common; Ottershaw, a small colony vii.52 in a field now ploughed; Sheerwater, few; near Butts Wood, one 25.viii.46. Only the second brood noticed.
- Polyommatus icarus* Rott. General and fairly common. Two broods. Once in Oatlands light-trap.
- Celastrina argiolus* Linn. Widespread and fairly common except on the heaths. Two broods.
- Lysandra coridon* Poda. Longcross, one male flying over heather 1.viii.55 (R.F.B.); Chobham Village, one in 1948 (C.W.P.). Probably strays: no station is known in the District.

#### HESPERIIDAE.

- Pyrgus malvae* Linn. Local, fairly common.
- Erynnis tages* Linn. Local, commoner than the last species. Sheerwater, one of second brood 12.viii.40 (H.G.S.).
- Thymelicus sylvestris* Poda. Widespread and locally common.
- T. lineola* Ochs. One record only. Bagshot district (actually, Bisley) 3.vii.27 (I. R. P. Heslop: *Ent.*, 61: 139). It may well be a resident of low density, overlooked among the previous species here, as is known to be the case in other parts of southern England.
- Ochlodes venata* Br. & Grey. General, but only fairly common.



## SPHINGES.

## SPHINGIDAE.

*Mimas tiliae* Linn. All traps, scarce. Egham, scarce; Longcross, occasionally; Ottershaw, several very large males "assembled" to a bred female through the open windows of a room, 1951 (R.E.R.P.); Oatlands, at rest; Sheerwater, once.

*Laotoë populi* Linn. All traps, common to very common. Egham, common; Longcross; Ottershaw, larvae common on aspen; Oatlands, larvae, and moths at rest; Sheerwater, larvae; Hook Heath; Cobbett Hill; Ash Vale. A partial second brood in some years.

*Smerinthus ocellatus* Linn. All traps, common. Egham, common; Longcross; Ottershaw, larvae frequent on apple; Sheerwater; Cobbett Hill; Ash Vale.

*Acherontia atropos* Linn. A scarce immigrant. 1932: Egham, one (C. de W.: *Ent.*, **65**: 231). 1938: Egham, pupa 10.ix (C. de W.: *Ent.*, **72**: 8). 1940: Pirbright, one larva (H.B.L.). 1950: Walton-on-Thames, New Haw, Addlestone, a number of larvae brought to A.A.B. from 26.vii onwards, from which several moths were bred; Pirbright, one pupa (H.B.L.).

*Herse convolvuli* Linn. A scarce immigrant. 1895: Weybridge, two in early ix, four 14/17.ix (Rev. J. E. Tarbert: *Ent.*, **28**: 336); Addlestone, 29.ix (E. H. Taylor: *Ent.*, **31**: 266). 1947: Ottershaw, two at tobacco flowers 16/19.ix (R.F.B.); Pirbright, three at tobacco flowers 21/23.ix (H.B.L.). 1951: New Haw trap, 28.ix. 1952: Oatlands trap, 29.viii, 30.ix; Horsell trap, 28.viii.

*Sphinx ligustri* Linn. All traps, fairly common. Ottershaw and Weybridge, moths at rest.

*Hyloicus pinastri* Linn. All traps, now fairly common. First appeared in the District at Bagshot and Pirbright, 1948; Longcross and Ash Vale, 1949; Ottershaw, New Haw and Sheerwater, 1950. Also seen as moth or larva at Englefield Green, Chobham Common, Hook Heath, Lucas Green, Cobbett Hill: is probably established on the larger *Pinus sylvestris* Linn. throughout the area. Larvae have been reared on *Cedrus libani* Loud.

*Celerio galii* Rott. Once only: a scarce vagrant. Pirbright, in a lighted room, 14.vii.38 (H.B.L.: *Ent.*, **71**: 238).

(*Daphnis nerii* Linn.) Once only: a scarce vagrant. One "captured by Mr Smith at Addlestone, 1870: *e coll. Tutt*" was sold from the Adkin Collection in January, 1949. It fetched £17.

*Deilephila porcellus* Linn. All traps, very scarce to scarce. Egham, bred; Hook Heath, two at light 1955. Chertsey, several over bed-straw at dusk, early vi.1864 (A.H.C.: *E.M.M.*, **1**: 192).

*D. elpenor* Linn. All traps, common to very common. General. Larva usually on *Epilobium* but also on *Impatiens fulva* Nutt. and *Galium palustre* Linn.



*Macroglossum stellatarum* Linn. An irregular immigrant. Before 1939: Egham, frequently. 1943: Sheerwater, 13.vi. 1947: Ottershaw, several; Longcross; Pirbright, very common. 1949: Ottershaw, a few.

*Hemaris fuciformis* Linn. Sheerwater, 21.vi.36, 24.vi.40 (H.G.S.); Stanner's Hill, 30.v.50 (R.F.B.); Pirbright, larvae in gardens and woods (H.B.L.). Surprisingly scarce, though the foodplant, *Lonicera*, abounds.

*H. tityus* Linn. (*bombyliiformis* Esp.). Pirbright, one at *Nepeta* flowers, 20.vi.44 (H.B.L.); Clasford Common, rather numerous 1945/6 (R.W.P.). The foodplant, *Scabiosa succisa* Linn., is local.

## BOMBYCES.

### NOTODONTIDAE.

*Cerura hermelinea* Goeze (*bifida* Hübn.). All traps, scarce to very scarce. Egham; Woking; Chobham, larvae. Normally one brood, but examples taken at Egham 8.viii.35 and Horsell 16.viii.53 may represent partial second broods.

*C. furcula* Linn. All traps, scarce, except Pirbright, common. General, and certainly commoner than the last species. Two broods.

*C. vinula* Linn. All traps, scarce to fairly common. Widespread among poplars, but nowhere numerous.

*Stauropus fagi* Linn. Ottershaw and Oatlands traps, fairly common, New Haw and Horsell, scarce, Pirbright, very scarce. Larvae on apple at Ottershaw and oak at Sheerwater, and female moths at rest as well as occasionally at light. Cobbett Hill, fairly common at light. Melanic forms of the moth predominate, the pale grey type being less than 10% of the population here.

*Drymonia trimacula* Esp. All traps, fairly common to common, as generally at light: otherwise seldom seen in any stage. Five melanic examples have been taken at Horsell, and abnormally white specimens also occur.

*D. ruficornis* Hufn. (*chaonia* Hübn.). All traps, common to very common, including a few females. General, but seldom seen except at light.

*Pheosia tremula* Clerck. All traps, common, as generally where there is poplar or aspen. Two broods, in protracted and usually overlapping emergences.

*P. gnoma* Fabr. (*dictaeoides* Esp.). All traps, common to very common, as generally. Two broods, more distinct than in the last species. An extreme suffused male ab. ? *fernandi* Redt. at Ottershaw, 21.viii.55.

*Notodonta ziczac* Linn. All traps, fairly common to common, as elsewhere among willow and aspen.. Two broods.

*N. dromedarius* Linn. All traps, fairly common to common. Abundant among birch on the heaths. Two broods.

*N. anceps* Goeze (*trepida* Esp.). All traps, fairly common to common: females hardly seen. Apparently rather local. Egham, twice; Stonehill; Woking; Bagshot.

*Lophopteryx capucina* Linn. (*camelina* Linn.). All traps, fairly common to common, as elsewhere both as moth and larva. Two overlapping broods.

*Odontosia carmelita* Esp. All traps, except Oatlands, very scarce (thirteen in all). Horsell Common, one at a paraffin lamp (A.A.B.); Chobham, larvae beaten 1910 (H.G.C.: *E.M.M.* 47: 41). Probably widespread among old birch, but not numerous and certainly elusive.

*Pterostoma palpina* Linn. All traps, fairly common. Egham, common; Byfleet; Chobham; Bagshot; Ash Vale. Two broods.

*Phalera bucephala* Linn. All traps, common to very common. Larvae abundant everywhere. A single emergence, spread over fourteen weeks. An aberration with the silver scales almost lacking taken at Ottershaw 5.vi.54 (R.F.B.).

*Clostera curtula* Linn. All traps, fairly common, except Pirbright, scarce. Egham, few; Sheerwater, moths, and larvae common on aspen; Chobham, larvae; Ash Vale. The second brood, of a darker brown colour, is partial only.

*C. pigra* Hufn. Ottershaw trap, once, Horsell and Pirbright, very scarce. New Haw, fairly common. Larvae at Sheerwater, Chobham Common, Pirbright, Ash Vale, usually on *Salix repens* Linn., which is very local on the heaths; but I have once found them on an isolated bush of *Salix cinerea* Linn. Two broods, of which the second appears to be the more numerous.

#### THYATIRIDAE.

*Habrosyne derasa* Linn. All traps, very common. Elsewhere at sugar and light throughout the District. A partial second brood appeared in late August and September 1952 and 1955.

*Thyatira batis* Linn. All traps, scarce to very scarce. At sugar, Ottershaw, Chobham, Sheerwater; at light, Hook Heath, Cobbett Hill; but seldom common. A strong second brood at Ottershaw 20/28.viii.55.

*Tethea ocularis* Linn. (*octogesima* Hübn.). All traps, fairly common. Egham, a few; Sheerwater, Chobham Common, at sugar and light; larvae on aspen at Ottershaw and Chobham.

*T. or* Fabr. Once only. Lucas Green, one rather worn at light 22.viii.55—a very late date (R.F.B. & J.L.M.).

*T. duplaris* Linn. All traps, very scarce to scarce. Horsell, at street lamps; Sheerwater, once at sugar and once at light, and larvae 12.ix.36. A small and dingy race, and curiously rare.

*Asphalia diluta* Schiff. All traps, very scarce to scarce. Cobbett Hill, at light. Several of f. *nubilata* at New Haw 1948 (A.A.B.).

*Achlya flavicornis* Linn. All traps, fairly common to common, except Horsell, very common. Abundant among small birch on the heaths.

*Polyplocia ridens* Fabr. All traps, very scarce to scarce. Longcross, once. Commoner as larva at Ottershaw, Byfleet, Pirbright. The moths are usually melanic.

## LYMANTRIIDAE.

- Orgyia antiqua* Linn. Ottershaw, New Haw, Oatlands traps, very scarce. Not often seen even by day, except at Weybridge and Hook Heath. Larvae noticed at Sheerwater, Oatlands (on rose), Ash Vale.
- Dasychira fascelina* Linn. Oatlands trap, twice, Ottershaw and New Haw, fairly common; Horsell and Pirbright, common. Very variable. Larvae swarm locally on the heaths, but many are diseased.
- D. pudibunda* Linn. All traps, common to very common, as elsewhere in all stages. A smoky grey aberration is occasional.
- Euproctis similis* Fuessl. All traps, common to abundant, as elsewhere. A very few examples of a second brood, all dwarfs, were seen in 1947, 1949, 1952.
- Leucoma salicis* Linn. New Haw trap, 29.vii.50, 20.vii.52; Oatlands trap, 30.vi.53, 26.vii.55.
- Lymantria monacha* Linn. All traps, scarce to very scarce. Egham, once at light; Cobbett Hill, common; Bagshot, 30.viii.50. Its rarity is surprising in view of the abundance of oak.

## LASIOCAMPIDAE

- Malacosoma neustria* Linn. All traps, fairly common, except New Haw. abundant. Egham, scarce; Sheerwater, larvae occasional; Chobham Common, Cobbett Hill, Camberley, Ash Vale, at light. The food-plant, sloe, is distinctly local in the area, and the species is certainly less prominent than in most places. An aberration with joined bands taken at Horsell viii.52; and another without bands at Ottershaw, 25.vii.51 (R.E.R.P.).
- Trichiura crataegi* Linn. Once only: New Haw trap, 23.viii.47.
- Poecilocampa populi* Linn. All traps, common to abundant. Larvae not infrequent on oak in many places.
- Lasiocampa quercus* Linn. Horsell and Pirbright traps, females, very scarce. Moths and larvae scarce on Horsell and Chobham Commons, but abundant round Pirbright and Ash Vale.
- Macrothylacia rubi* Linn. Ottershaw, New Haw, Horsell and Pirbright traps, females, very scarce. Moths and larvae on heaths at Sheerwater, Chobham, Windlesham, Cobbett Hill, Ash Vale, but seldom really common.
- Philudoria potatoaria* Linn. Ottershaw, Horsell and Oatlands traps, very scarce; New Haw trap, fairly common; Pirbright trap, very common. Egham, common; Longcross, Byfleet, larvae; Chobham Common, Lucas Green, Cobbett Hill, Ash Vale, at light.
- Gastropacha quercifolia* Linn. All traps, very scarce. Egham, once at light; Lucas Green, four at light 11.vii.55; Cobbett Hill; Byfleet; Ash Vale; Gracious Pond, larvae on willow.

## SATURNIIDAE.

- Saturnia pavonia* Linn. New Haw, Oatlands and Pirbright traps, females, very scarce. Common on all the heaths, and males may be assembled by scores. Larvae on heather, willow, meadow sweet.

## DREPANIDAE.

- Drepana binaria* Hufn. Common to very common in all traps, and among oak throughout the area. Two full broods.
- D. cultraria* Fabr. Ottershaw, New Haw and Oatlands traps, scarce to fairly common. Botley's Park; Foxhills; Longcross. Local, where beech is well established. Two full broods.
- D. falcataria* Linn. All traps, common. Among birch everywhere. Two full broods.
- D. lacertinaria* Linn. All traps, fairly common to common. Abundant on the heaths. Two broods.
- Cilix glaucata* Scop. All traps, common, as elsewhere. Always two broods, with a third in 1947, 1949, 1952.

## NOLIDAE.

- Nola cucullatella* Linn. New Haw and Pirbright traps, common; Ottershaw and Horsell, fairly common; Oatlands trap, very scarce; Oatlands, on trunks. Its abundance depends on the presence of *Prunus*, cultivated or otherwise.
- N. strigula* Schiff. Once only. New Haw trap, 5.vii.52.
- Celama confusalis* H.-S. Ottershaw, Oatlands and Horsell traps, scarce to very scarce. At Ottershaw and Oatlands, commoner on oak trunks in the garden; Chobham Clump, at light; Bagshot, rather numerous locally.

## HYLOPHILIDAE.

- Earias clorana* Linn. Ottershaw trap, 26.viii.55, worn; New Haw trap, 6.vii.52; Oatlands trap, 1.vii.51, 27.vii.55. Probably a surviving marsh species.
- Bena prasinana* Linn. All traps, fairly common. Byfleet (larvae); Chobham Common; Woking.
- Pseudoips bicolorana* Fuessl. All traps, very scarce to scarce. Sheerwater, once; Chobham Common, Lucas Green, several at light; Woking, larvae; Chertsey, at sugar 4.vii.1865 (A.H.C.: *Ent. Ann.*, 1866: 152).
- Sarothrips revayana* Scop. (*undulana* Hübn.). All traps, scarce. Commoner as larvae at Ottershaw, Byfleet, Chobham, Woking, Ash Vale. A uniform black form of the moth is the rule.

## ARCTIIDAE.

- Spilosoma lubricipeda* (*menthastri*) Esp. (The White Ermine). All traps, abundant, as throughout the area. A few in late August, 1952, probably of a partial second emergence.
- S. urticae* Esp., All traps except Oatlands, very scarce. Egham, one at light 17.vi.34; Woking, by the canal, 1911/14.
- S. lutea* Hufn. (The Buff Ermine). All traps, very common, but less numerous than *S. menthastri* throughout the area. A few in August, 1952 and 1955, probably of a second emergence.

- Cynia mendica* Clerck. All traps, fairly common to common. Egham, common; Longcross, frequent; Ash Vale.
- Diacrisia sannio* Linn. All traps, very scarce to scarce. Locally common on heaths at Sheerwater, Horsell, Chobham Clump, Cobbett Hill, Ash Vale.
- Phragmatobia fuliginosa* Linn. All traps, common, except Horsell, fairly common. General. The main emergence is vii/viii, but a few appear in v/vi and some, presumably their offspring, in ix.
- Arctia caja* Linn. All traps, common, as generally.
- A. villica* Linn. All traps, very scarce to scarce. Egham, a few; Longcross; Ottershaw, larvae; Sheerwater, few; Horsell, 1911/14; Cobbett Hill.
- Panaxia dominula* Linn. Once only. Oatlands trap, 30.vi.52.
- Callimorpha jacobaeae* Linn. All traps, abundant, except Horsell, where only 26 were taken 1952/55. Numbers declining generally at present. Aberration with all markings smoky pink at Ottershaw, 30.vi.50.
- Atolmis rubricollis* Linn. Once only. Oatlands trap, 13.vi.52.
- Comacla senex* Hübn. All traps, very scarce, except Horsell, absent. Egham, scarce: Sheerwater, swarms in one spot by the canal; Gracious Pond, 15.vii.55 (R.F.). A record of *Nudaria mundana* Linn. from Chertsey, 15.vii.1863, probably refers to *Comacla senex* (A.H.C.: *Week. Ent.*, 2: 212).
- Mittochrista miniata* Forst. All traps, fairly common to common, as generally.
- Setina irrorella* Linn. Ottershaw trap, 10.vi.48; New Haw trap, 17.vi.48, 28.vi.49, 21.vi.50. Probably stragglers from the North Downs, where it is locally common.
- Cybosia mesomella* Linn. Ottershaw, Horsell and Oatlands traps, very scarce; New Haw and Pirbright traps, fairly common; Egham, once; Horsell and Chobham Commons, locally plentiful in wet places; Lucas Green; Cobbett Hill. A yellow aberration near Chobham Clump, 18.vii.54 (R.F.B.).
- Eilema deplana* Esp. Twice only. Oatlands trap, 27.vii.51; Byfleet, one worn 29.vii.33. Probably stragglers from the chalk yew woods.
- E. griseola* Hübn. Horsell trap, scarce; Oatlands and Ottershaw, fairly common; New Haw and Pirbright, common; Sheerwater; Chobham Sow Moor; New Haw Bridge; Cobbett Hill. The yellow f. *flava* Haw. is very rare: Ottershaw, 2.viii.51; Byfleet, 25.vii.08 (S.L.E.S., 1907/8: 67); Chertsey (A.H.C.: *Week. Ent.*, 2: 212).
- E. lurideola* Zinck. All traps, very common, as elsewhere.
- E. complana* Linn. All traps, common. Throughout the area, especially on heaths.
- E. sororcula* Hufn. Ottershaw trap, 24.v.53; Oatlands, three 14/16.v.52, one 24.v.53; Horsell trap, 11.v.54; Pirbright trap, once. Bagshot, 23.v.49 (R.W.P.)

## AGROTIDES (NOCTUAE).

## CARADRINIDAE.

*Colocasia coryli* Linn. All traps, fairly common to common. General. Two full broods.

*Episema caeruleocephala* Linn. All traps, very scarce, except Horsell, absent. Ottershaw, one larva on damson (R.F.B.). Strangely rare.

*Apatele leporina* Linn. All traps, fairly common to common, as generally among birch, which is its foodplant here. At Ottershaw an old fence beneath a birch tree was found to be riddled with pupation chambers. Usually one prolonged emergence, but apparently a partial second in viii.53. Pale, almost unmarked specimens are frequent.

*A. aceris* Linn. All traps, fairly common to common. Egham, scarce; Ottershaw, moths on trunk and at sugar and larvae on horse chestnut; Sheerwater, larvae occasional; Woking, 1911/14. Very dark examples sometimes occur.

*A. megalcephala* Fabr. All traps, common to fairly common, as generally. A small second brood in 1952. A completely black aberration at Oatlands, 1955 (J.L.M.).

*A.alni* Linn. Three records only. Oatlands trap, 24.v.52; Sheerwater, a nearly full-fed larva on birch (C. N. Hawkins: *S.L.E.S.*, 1933/4: 28); a larva being abducted by ants at the base of an oak, 26.vii.40 (H.G.S.).

*A. psi* Linn. All traps, common. Egham; Sheerwater; Byfleet; Ash Vale. Two broods, but the emergences often overlap.

*A. tridens* Schiff. The difficulty of separating the moth from the previous species makes its distribution and abundance uncertain; but it is certainly much scarcer. Ottershaw trap, scarce (of 37 males of which the genitalia were examined, 8 proved to be *tridens* and 29 *psi*); Oatlands trap, 6 *tridens*, 17 *psi*; Bullswater Common, two larvae 1943; Ash Vale, larva 10.vi.50. The dates indicate two broods: 25.v.53, 29.v.54, 6 and 17.vii.54, 2, 8, 15.viii.54, 17.vii/12.viii.55.

*A. rumicis* Linn. All traps, very common to common; and common elsewhere. Two full broods. The black ab. *salicis* Curtis is frequent.

*Cryphia perla* Fabr. All traps, very common to common, as elsewhere. A yellow example at Horsell, 4.ix.52.

*Agrotis segetum* Schiff. All traps, very common to abundant, as elsewhere. Two full broods. Melanic forms occur, and also pale specimens with the markings reduced or absent.

*A. vestigialis* Rott. All traps: Ottershaw, very scarce, New Haw, Oatlands, Horsell, scarce, Pirbright, common. Widespread on the heaths, but not numerous. A dark, strongly marked form, appearing mid-July to mid-August.

*A. clavis* Hufn. (*corticea* Hübn.). All traps, very common, as generally. Very variable in ground colour, from pale grey to black.

*A. cinerea* Hübn. Once only. Egham, at light, 29.v.34.

- A. puta* Hübn. All traps, very common to abundant, as generally. Two broods, specimens of the first being markedly larger.
- A. exclamationis* Linn. All traps, dominant, as generally. At Ottershaw it is in most years the commonest moth, accounting on average for 10% of the total attendance. A few in viii/ix.49, 52, 55, represented a partial second brood. Variable: extreme melanic forms at Oatlands.
- A. ipsilon* Rott. All traps, usually only fairly common, but abundant in 1952 and 1955. Two broods, with odd specimens between: the first is much smaller in number than the second. Probably resident, but reinforced by immigrants.
- Euxoa nigricans* Linn. All traps, scarce. Elsewhere at flowers and sugar.
- E. tritici* Linn. Ottershaw, New Haw traps, common; Oatlands, fairly common; Horsell and Pirbright, scarce. Sheerwater; Gracious Pond, common at ragwort; Hook Heath, one; Bagshot, frequent. Small, very dark females occur on the heaths.
- Lycophotia varia* Vill. (*strigula* Thunb.). All traps, common to very common, except Horsell, dominant. Dominant locally on the heaths. Has become steadily commoner for four years.
- Peridroma porphyrea* Schiff. (*saucia* Hübn.). All traps, fairly common. Chertsey Mead, at sugar and reed blossom; Sheerwater, fairly common in 1939. Occurs annually in varying numbers in the autumn and in some years also in May: whether these early examples are locally bred or immigrant is not clear. Light, mottled, and melanic forms all occur.
- Graphiphora augur* Fabr. All traps, fairly common. Commoner near woods, widespread.
- (*Amathes agathina* Dup.) Horsell Common, a few at heather bloom early ix.1910 and many larvae in v.1911/13 (H.G.C.: *E.M.M.*, 48: 45, and bred series in O.U.M.). Not found recently, despite much search: its decline may be due to burning of most of the deep heather. There are unconfirmed reports that it still exists near Ash Vale.
- A. glauca* Esp. All traps, very scarce, except Oatlands, where it occurs annually and there were 10 in 1955. Egham, two ix.32 and 34; Woking, at light 1910; Hook Heath, two at light 1955; Ash Vale, 24.viii.46.
- A. castanea* Esp. Ottershaw and New Haw traps, very scarce; Horsell, fairly common. Virginia Water; Chertsey, at sugar ix.1864 (A.H.C.: *E.M.M.*, 1: 192). Chobham Common; Hook Heath; Lucas Green; Ash Vale. Locally common on heaths both as moth and larva. Red forms are occasional.
- A. baja* Fabr. All traps, common to very common. Abundant on heaths. Very dark forms occur, some with the apical spot missing.
- A. c-nigrum* Linn. All traps, dominant, as generally. Two broods, the first of larger moths but much smaller numbers. An extreme albino aberration taken at New Haw (A.A.B.).



- A. ditrapezium* Borkh. Ottershaw, New Haw, Oatlands traps, very scarce; Horsell, once. Weybridge, once (J.L.M.); Lucas Green, 11 and 20.vii.55 (J.L.M., C. de W.). A moth of clay soils, barely reaching into the District.
- A. triangulum* Hufn. All traps, common to very common, as generally. (*A. stigmatica* Hübn.) One moth beaten out of birches in a copse near Chobham, 1910 (H.G.C.: *E.M.M.*, 47: 41).
- A. sexstrigata* Haw. (*umbrosa* Hübn.). All traps, fairly common to common. General, commoner at flowers and sugar.
- A. xanthographa* Fabr. All traps, very common to abundant. General.
- Diarsia brunnea* Fabr. All traps, scarce, except Pirbright, absent. Butts Wood; Longcross; Hook Heath; Lucas Green. Mainly in woods.
- D. festiva* Schiff. (*primulae* Esp.). Pirbright trap, very scarce, Ottershaw, New Haw, Oatlands, fairly common, Horsell, very common. Common at sugar and as larva in woods and edges of heaths. Variable: both rich red and pale grey forms occur.
- D. rubi* View. All traps, common to very common, as generally. Two full broods, the first being markedly larger moths.
- Ochropleura plecta* Linn. All traps, abundant, as generally. Two full broods, the first being much the less numerous.
- Axylia putris* Linn. All traps, very common to abundant, as generally. A few examples of a second brood in late viii/ix.52 and 55.
- Eurois occulta* Linn. Once only. Horsell, at sugar, 14.viii.45 (C. de W., *Ent.*, 78: 144, 174). Probably a migrant, though the food-plant *Myrica gale* Linn. survives here and there on Chobham Common and near Bisley. Another specimen was taken at Esher, not far outside the District, on the same night.
- Anaplectoides prasina* Fabr. Three only. Ottershaw trap, 29.vi.53; Horsell trap, 21.vii.55; Longcross, one in 1949 (C.W.P.). Its scarcity is surprising in view of the abundance of birch.
- Triphaena comes* Hübn. All traps, common to very common, as generally. Melanic forms are occasional. Specimens seen in October, 1952, were probably of a partial second brood.
- T. orbona* Hufn. (*subsequa* Hübn.). Once only. New Haw trap, 2.viii.50.
- T. janthina* Esp. All traps, very common to abundant, as generally.
- T. pronuba* Linn. All traps, dominant, as generally. Probably a partial second brood in 1952.
- T. interjecta* Hübn. All traps, fairly common to common. Egham, scarce; Ottershaw gardens, at flowers; Sheerwater, occasional at light; Lucas Green.
- Lampra fimbriata* Schreber. All traps, common, as generally. Larvae sometimes abundant in early May.
- Polia tineta* Brahm. Oatlands and Pirbright traps, very scarce; Ottershaw and New Haw, fairly common; Horsell, common. Common locally as larvae and moths among small birch on all the heaths.



- Polia nitens* Haw. (*advena* auctt.). Ottershaw trap, 17 and 19.vii.54, 9.vii.55; New Haw trap, 1.vii.50, vii.55; Horsell trap, 28.vii.54; Oatlands trap, 9.vii.55.
- P. nebulosa* Hufn. All traps, fairly common to common, as generally.
- Mamestra brassicae* Linn. All traps, common to very common, as elsewhere except on the heaths. Two broods.
- Melanchra persicariae* Linn. All traps, very common to abundant. General elsewhere, least common on the heaths.
- Ceramica pisi* Linn. All traps, common to very common. General.
- Diataraxia oleracea* Linn. All traps, very common, as generally. A small second brood in late viii/ix.52 and 55, and one at sugar 1.xi.47.
- Hadena w-latinum* Borkh. (*genistae* Borkh.). All traps, common to very common, as elsewhere.
- H. suasa* Schiff. (*dissimilis* Knoch). Ottershaw, Oatlands traps, scarce; New Haw, Horsell, very scarce. Apparently two broods, but very irregular in times of emergence.
- H. thalassina* Rott. All traps, fairly common to common, except Oatlands, very scarce. Egham, a few; Sheerwater; Butts Wood, at sugar; Cobbett Hill.
- H. contigua* Vill. All traps, fairly common, except Horsell, common. Very common on all the heaths, both as moth and larva.
- H. trifolii* Rott. All traps, very common, as elsewhere. Two broods, the first being much less numerous.
- H. nana* Hufn. (*dentina* Esp.). All traps, fairly common. Egham, few; Sheerwater, few; Butts Wood, at sugar; Hook Heath, common.
- H. conspersa* Esp. Three only. New Haw trap, 30.vi.51, one later; Oatlands, 23.vi.55. Probably strays from the chalk.
- H. bicurris* Hufn. (*capsincola* Hübn.). All traps, fairly common to common. Frequent at flowers in gardens. Two broods, the second partial only.
- H. cucubali* Fuessl. All traps, scarce, except Ottershaw, once only. Egham, one 25.vii.53; Hook Heath, common 1955; Lucas Green, 22.viii.55; Cobbett Hill. Two broods.
- H. lepida* Esp. (*carphophaga* Borkh.). Ottershaw trap, 28.v. and 5.vi.51, 16.vi.54; New Haw trap, 31.vii.50, 7.ix.51; Oatlands trap, eight 1952/6; Horsell trap, one vi.55; Weybridge, 31.v.51. The various wild species of *Silene* and *Lychnis*, which are the normal food-plants of the four last species, are scarce in the District, and it seems likely that the larvae here depend on cultivated Pinks in gardens.
- H. serena* Fabr. All traps, common to fairly common. Egham, a few; Sheerwater; Longcross; Lucas Green; Ash Vale, larvae. No second brood noticed.
- Heliophobus albicolon* Hübn. Ottershaw, New Haw, Oatlands and Horsell traps, very scarce, but annually. This species is usually an inhabitant of coastal sandhills, and its presence here is remarkable.
- H. saponariae* Esp. (*reticulata* Vill.). Ottershaw trap, 1 and 24.vi.53, 5 and 8.vi.54; New Haw, 9.vi.50, 12.vi.52; Oatlands, 9.vi.53, 18.vii.54, 23.vii.55; Horsell, 30.vi.53. A North Downs species.

- Tholera popularis* Fabr. Ottershaw trap, scarce; Horsell, New Haw and Oatlands, fairly common; Pirbright, abundant; Sheerwater, at light; Hook Heath, common. Less common in the District than in most places.
- T. cespitis* Fabr. All traps, fairly common to common. Egham, few; Hook Heath, two 1955.
- Cerapteryx graminis* Linn. All traps, very scarce. Egham, few; Hook Heath, few; Lucas Green, at light 11.vii.55; Cobbett Hill, one; Bagshot. Notably rare in the District.
- Dryobotodes protea* Schiff. All traps, common, as generally as larva and at sugar.
- Bombycia viminalis* Fabr. Oatlands trap, very scarce; Ottershaw and Horsell, scarce; Pirbright, common; New Haw, very common. Egham, a few; Sheerwater, larvae, and moths at dusk and at sugar; Butts Wood; Chobham Sow Moor; Lucas Green. Melanic forms occur.
- Eremobia ochroleuca* Esp. Three only. New Haw trap, 8.viii.50; Oatlands, female 10.viii.55; Pirbright, once. Probably a stray from the chalk.
- Luperina testacea* Esp. All traps, abundant to very common, as elsewhere.
- Thalophila matura* Hufn. All traps, common to very common, as elsewhere, even on the heaths.
- Procus strigilis* Clerck. All traps, common, as elsewhere. Mottled forms predominate, but almost unicolorous black specimens are frequent.
- P. latruncula* Schiff. All traps, common, though less so than *P. strigilis*. In wet places, as by the Basingstoke Canal, it seems to be the commoner. It appears about a week later. Black forms predominate, mottled ones being rare.
- P. versicolor* Borkh. Ottershaw and Oatlands traps and sugar: five specimens have been verified, but the species is certainly scarce.
- P. fasciuncula* Haw. All traps, scarce to fairly common. Longcross; Lucas Green; Camberley. Locally common in damp meadows.
- P. literosa* Haw. All traps, scarce, except Horsell, once. Sheerwater, several in 1936. Usually a coastal species, whose presence here is notable.
- P. furuncula* Schiff. (*bicoloria* Vill.). All traps, fairly common, except Horsell, very scarce. Frequent generally at ragwort blossom. Very variable, pale, dark, and mottled forms all occurring.
- Apamea anceps* Hübn. (*sordida* Borkh.). All traps, common. General at sugar.
- A. obscura* Haw. (*gemina* Hübn.). All traps, common, as generally. The f. *remissa* Hübn. is scarce.
- A. sordens* Hufn. (*basilinea* Fabr.). All traps, very common, as everywhere.
- A. unanimitis* Hübn. All traps, scarce, except Oatlands, common. In wet ditches and marshes: Chertsey Mead, larvae; Sheerwater, pupae and at sugar; Chobham Sow Moor.

- A. secalis* Linn. All traps, abundant. A plague at sugar and ragwort everywhere.
- A. ophiogramma* Esp. Oatlands trap, fairly common; New Haw and Pirbright, very scarce. In marshes: Chertsey Mead, larva; New Haw canal bridge, at dusk; Woking, at light, 1907/13. Melanic aberration at Oatlands, 22.vii.53.
- A. crenata* Hufn. (*rurea* Fabr.). All traps, fairly common, except Oatlands, very scarce. Only locally abundant, as at Butts Wood. The unicolorous dark f. *combusta* Haw. predominates, the type being scarce.
- A. sublustis* Esp. Ottershaw and Horsell traps, very scarce; New Haw and Oatlands, scarce. Horsell, a few at sugar (C. de W.); Lucas Green, one at light 11.vii.55 (R.F.B.).
- A. lithoxylea* Fabr. All traps, fairly common to common, as elsewhere.
- A. monoglypha* Hufn. All traps, abundant, except Ottershaw, dominant. A pest everywhere.
- A. hepatica* Hübn. All traps, scarce to fairly common, except Pirbright, absent. Egham, few; Sheerwater, common at sugar; Butts Wood, many; Lucas Green. A woodland species.
- A. scolopacina* Esp. Ottershaw, New Haw and Oatlands traps, scarce; Horsell and Pirbright, very scarce. Sheerwater, several at light and sugar; Butts Wood, on ragwort; Lucas Green, at light: Chertsey, one 27.vii.1863, and "tolerably common at bramble blossom" in 1862 (A.H.C.: *Week Ent.*, 2: 238).
- A. ypsilon* Borkh. (*fissipuncta* Haw.). Ottershaw and New Haw traps, scarce, Oatlands and Horsell, very scarce. Among willows. Egham, once; Chertsey Mead; Sheerwater, common at sugar; Chobham Sow Moor.
- Dypterygia scabriuscula* Linn. All traps, common to very common, as elsewhere. Examples of a second brood in late viii/ix.49 and 52.
- Aporophyla lutulenta* Borkh. All traps, scarce, except Pirbright, common.
- A. nigra* Haw. All traps, common to very common. Also generally at light, sugar, and ivy.
- Antitype flavicincta* Fabr. All traps, fairly common, except Oatlands, very scarce. Egham, very common; Chertsey, on fences; Ottershaw, common at sugar; Sheerwater, occasional 1932, 1939, 1943; Hook Heath, common.
- Griposia aprilina* Linn. All traps, very scarce. Egham, few. Curiously rare in the district. A male with confluent black bands, Ottershaw, 6.x.53 (R.F.B.).
- Meganephria oxyacanthae* Linn. All traps, common to very common, as elsewhere. The black f. *capucina* Mill. is frequent, but abnormally pale forms also occur.
- Brachionycha sphinx* Hufn. New Haw trap, 4.xi.47, 7.xi.50; Horsell trap, 27.x.51, two 20.xi.53, 5.xi.54, xi.55. Ottershaw, one xi.55 (R.E.R.P.); Cobbett Hill, three at light 7/13.xi.55 (A.J.S.). Apparently widespread, but rare.

- Euplexia lucipara* Linn. All traps, common, as generally. One at Ottershaw 25.ix.53 and a few more autumn specimens of a partial second brood.
- Phlogophora meticulosa* Linn. All traps, very common. Two broods, the first one-third to one-tenth in numbers of the second.
- Celaena leucostigma* Hübn. Horsell trap, once; Ottershaw and New Haw, twice; Oatlands, fairly common. Chertsey Mead, a few at sugar vii.50 (R.F.B.). *F. fibrosa* Hübn. has been found at New Haw (A.A.B.).
- Phalaena typica* Linn. All traps, very scarce, except Ottershaw, absent. Egham, few; Longcross, frequent; Sheerwater, ten at sugar 15.vii.47 (R.F.B.), among willows.
- Hydraecia oculea* Linn. (*nictitans* Borkh.). All traps, common to fairly common. Egham, a few. General.
- H. paludis* Tutt. Verified from Ottershaw trap, 2 and 22.viii.53, 18.viii.54, 21.viii.55; New Haw, 24.viii.50; Horsell, 13.viii.53; and a number from Oatlands, where it approaches the numbers of *H. oculea*. Probably overlooked elsewhere, but certainly scarce, as is usual inland. Forms with the reniform stigma yellow are more numerous than those with white: in *H. oculea* it is here always white.
- H. micacea* Esp. All traps, very common to common, as generally. Swarms at reed blossom on Chertsey Mead. Variable in size and colour: a bright red f. *aurantia* Rich. at Ottershaw, 24.vii.54 (R.F.B.).
- H. petasitis* Doubl. Once only: Worplesdon Hill, at light, 26.viii.46 (Howell: *Ent.*, 80: 47). Repeated visits to a small patch of *Petasites* nearby have failed to reveal further traces of moth or larva.
- Gortyna flavago* Schiff. (*ochracea* Hübn.). All traps, fairly common to common (Horsell). Egham, once only; Chertsey Mead, common; Hook Heath; Cobbett Hill.
- Nonagria typhae* Thunb. All traps, very scarce. These are stragglers; but the species breeds wherever *Typha latifolia* Linn. is established, even in very small quantities. Egham, common; Brox gravel pit, larvae and pupae; Byfleet; Woking; Hermitage Bridge; Hook Heath; Ash Vale. The black f. *fraterna* Tr. is occasional.
- N. geminipuncta* Haw. Ottershaw, Oatlands, New Haw traps, very scarce. Sheerwater, in a reed bed, pupae 1933 and 1949, moth in 1955; Woking, 1910.
- N. dissoluta* Treits. Twice only. Oatlands trap, 20.vii.52, 22.viii.55. Presumably another relict marsh species.
- Coenobia rufa* Haw. All traps, very scarce except Horsell, absent. Egham, a few; Brox pit, common; Sheerwater; Woking, 1910; Chobham Common; Ash Vale. Locally abundant among *Juncus* in the less acid bogs
- Chilodes maritima* Tausch. Ottershaw trap, 17.vi.54; Oatlands, 6.vii.52, 6.viii.53. Sheerwater, in a reed bed, 30.vi. and 5.vii.49, vii.50, scarce.

- Arenostola pygmina* Haw. (*fulva* Hübn.). All traps, scarce, except Pirbright, common. Egham, few; Chertsey Mead, common; Chobham, common; Hook Heath, common; Cobbett Hill, very common; Camberley; Bagshot; Ash Vale. Reddish and black-suffused forms are frequent.
- A. phragmitidis* Hübn. Oatlands trap, 3.viii.54; Horsell, 27.vii.55; Pirbright, before 1940, scarce.
- Oria musculosa* Hübn. Twice only. New Haw trap, 10.viii.51; Oatlands trap, 6.viii.53. No doubt strays from the chalk downs.
- Rhizedra lutos*a Hübn. All traps, very scarce to scarce. Its headquarters is in reed beds, as on Chertsey Mead and at Sheerwater, where it is abundant. Fine reddish and black-suffused forms occur.
- Leucania pallens* Linn. All traps, abundant to very common, as elsewhere. Two full broods, often overlapping.
- L. impura* Hübn. All traps, very common to common. Abundant in wet places on the heaths.
- L. straminea* Treits. Oatlands trap, scarce. Sheerwater, moths scarce, but larvae fairly numerous on *Phragmites*, v.51 (R.F.B.); Woking, not uncommon in small reed-beds, vii.10.
- L. pudorina* Schiff. (*impudens* Hübn.). Oatlands and Pirbright traps, very scarce; Ottershaw and Horsell, scarce. Chertsey Mead; Butts Wood; Sheerwater, common at sugar; Woking, 1910; Horsell Common, numerous, 17.vii.48; Lucas Green, common.
- L. obsoleta* Hübn. Ottershaw trap, 8.vi.54; Horsell trap, 15.vi.54. Sheerwater, a few at sugar, dusk, and light annually 1947/52 (R.F.B.). Its haunt is now largely destroyed.
- L. comma* Linn. All traps, common to very common, as generally. One at New Haw, 10.x.49 (A.B.: *Ent.*, 83: 30).
- L. vitellina* Hübn. Once only. New Haw trap, 16.x.50. A vagrant.
- L. albipuncta* Fabr. Once only. Egham, at light, 15.viii.34. A vagrant.
- L. lithargyria* Esp. All traps, very common, as elsewhere. Aberrations with well developed cross-lines occur, and an extreme melanic specimen was taken at New Haw (A.A.B.).
- L. conigera* Fabr. All traps, scarce to fairly common. Egham; Sheerwater, occasional; Longeross; Butts Wood, at sugar, but not common; Hook Heath, two. Specimens with very dark fore- and hind-wings occur.
- Mythimna turca* Linn. Ottershaw trap, a pair, 10 and 18.vii.54, two 11.vii.55; Horsell trap, female 10.vii.54, one vii.55; Egham, 17.vii.29, 10.vii.46; Oatlands, one at a lighted window, 6.vii.49; Chobham Common, 3 and 10.vii.52, at mercury vapour light (E.H.W.).
- Meristis trigrammica* Hufn. All traps, abundant to very common, as everywhere else. Dark unicolorous, and dark banded, forms are numerous.
- Caradrina morpheus* Hufn. All traps, common to very common, abundant at Horsell. Common generally at flowers.
- C. alsines* Brahm. All traps, common to very common, as elsewhere.

- C. taraxaci* Hübn. (*blanda* Treits.). All traps, very common to abundant, as elsewhere.
- Caradrina ambigua* Fabr. Unknown here before 1949, when many appeared in August on the heather blossom on Horsell and Chobham Commons and at light at New Haw. Since then, becoming common to very common at all traps until 1953: numbers were reduced in the cold season of 1954 and few were seen in 1955. Also plentiful at flowers and on reeds at Chertsey Mead. Two broods, the first being much smaller in number. Much variation from pale to dark ground colour.
- C. clavipalpis* Scop. (*quadripunctata* Fabr.). Horsell trap, very scarce, Ottershaw and New Haw, fairly common, Oatlands, common. Widespread at sugar and flowers, but not numerous. Two broods, with a partial third in October in hot seasons.
- Laphygma exigua* Hübn. An irregular immigrant, appearing in fair numbers in certain years and then probably breeding locally. 1937: Pirbright, one 14.viii. 1938: Egham, two at sugar 20.ix; Oatlands, three 24/31.vii; Pirbright, three 31.vii/1.viii. 1947: Ottershaw, four 16.viii/19.ix; New Haw, eight, 20.viii/6.x; Worplesdon Hill, one 14.viii; Egham, one 21.viii. 1949: Ottershaw, one worn 14.vii; New Haw, one 28.viii. 1950: New Haw, one 17.vii. 1951: Ottershaw, one 4.viii; New Haw, one 8.ix. 1952: Ottershaw, New Haw, Oatlands, Horsell, seven 7/8.iii; New Haw, one 2.vii; all traps, about fifty 2.viii/14.ix; Virginia Water, larvae on *Persicaria* early October. 1955: Ottershaw, one 21.viii; Oatlands, one 17.viii.
- Petilampyris minima* Haw. (*arcuosa* Haw.). All traps, fairly common. Egham, a few; Sheerwater; Chobham Sow Moor; Lucas Green; Ash Vale.
- Rusina umbratica* Goeze (*tenebrosa* Hübn.). All traps, very common to common, as elsewhere.
- Amphipyra pyramidea* Linn. All traps, fairly common to common, abundant at Horsell. General in the woods.
- A. tragopoginis* Linn. All traps, common to fairly common, as elsewhere.
- Dicycla oo* Linn. Ottershaw, New Haw and Oatlands traps, scarce, Horsell and Pirbright, very scarce. Sheerwater, Ottershaw, Chobham Sow Moor and Common, Lucas Green, at sugar and light; Knaphill, several. An elusive insect, which seems to fly to light or sugar only on warm nights, but is probably well distributed among large oaks. I have seen three ab. *renago* Haw. in about forty insects examined.
- Cosmia pyralina* View. Ottershaw, Oatlands and Pirbright traps, fairly common; New Haw, abundant; Horsell, scarce. Egham, common; Ottershaw and Sheerwater, common at sugar; Woking, 1910; Chertsey, several 15.vii.1865 (A.H.C.: *Ent. Ann.*, 1866: 152). Both bright and dark forms occur.
- C. affinis* Linn. All traps, very scarce, except New Haw, common. Egham, fairly common; Butts Wood, once at sugar.

- C. diffinis* Linn. All traps, very scarce to scarce. Egham, 14.viii.31.
- C. trapezina* Linn. All traps, abundant, as everywhere. Infinitely variable in ground-colour and strength of markings, but dark forms tend to predominate here.
- Zenobia retusa* Linn. All traps except Oatlands, very scarce. Ottershaw, one at sugar; Longcross, one in 1951; Butts Wood, at sugar and light; Chobham Sow Moor, once; Lucas Green, one; Woking Canal, 1907 (H.G.C.: *E.M.M.*, 43: 254).
- Z. subtusa* Fabr. All traps, very scarce. Egham, one 21.vii.29; Lucas Green, one 22.viii.55.
- Cerastis rubricosa* Fabr. All traps, common to fairly common. Generally fairly common at sallow and plum blossom.
- Panolis flammea* Schiff. (*piniperda* Panz.). All traps, fairly common, except Horsell, common. Generally common in the immediate neighbourhood of Scots pine.
- Orthosia gothica* Linn. All traps, abundant, dominant at Horsell. Everywhere at sallow and plum blossom. Very pale lilac forms occur rarely and a pure white aberration was taken at New Haw (A.A.B.).
- O. miniosa* Fabr. All traps, scarce. General among scrub oak near the heaths.
- O. cruda* Schiff. (*pulverulenta* Esp.). All traps, very common to abundant, as everywhere.
- O. stabilis* View. All traps abundant, except Horsell, dominant. A pest everywhere at sallow. A dark-banded form occurs.
- O. populeti* Treits. All traps very scarce, except Ottershaw, scarce. Egham, once; Ottershaw, a few at sallow and plum blossom; Byfleet, larvae and imagines 1934; Horsell, a few at sallow. One melanic female.
- O. incerta* Hufn. All traps, abundant, as elsewhere. Almost every possible form occurs.
- O. munda* Esp. All traps, scarce to fairly common. General at sallow and blossom, but seldom numerous.
- O. advena* Schiff. (*opima* Hübn.). Ottershaw, New Haw and Oatlands traps, scarce; Horsell and Pirbright, very scarce. Egham, three at light 1932/4. Some very dark specimens.
- O. gracilis* Fabr. All traps, fairly common to common. Egham, a few; Lyne, at sallows; Brox Pit; Byfleet, larvae; Horsell, at sallows. Two examples of f. *rufescens* Cockerell have been taken in Pirbright trap, and one found on *Myrica gale* not far off (R.F.B.).
- Atethmia xerampelina* Hübn. All traps, except Pirbright, very scarce. Egham, one in 1929; Hook Heath, one in 1955; Chertsey, at sugar 16.ix.1864 (A.H.C.: *E.M.M.*, 1: 192).
- Omphaloscelis lunosa* Haw. All traps, usually very common to abundant, but scarce in 1953 and 1954. Common generally. Very variable: reddish, as well as the usual black and buff forms occur.



*Parastichtis suspecta* Hübn. New Haw and Horsell traps, scarce; Ottershaw, Oatlands and Pirbright, very scarce. Sheerwater and Butts Wood, at sugar; Lucas Green, Camberley, Ash Vale, at light. Frequents large birch trees growing on the edges of the heaths.

*Agrochola lota* Clerck. New Haw and Oatlands traps, fairly common; Ottershaw and Pirbright, common; Horsell, very common. General at sugar, light and ivy. Variable in ground colour, and examples with the black reniform spot prolonged laterally, and others with it absent, have been taken at Ottershaw.

*A. macilenta* Hübn. All traps common, except Horsell, very common. General. A rich reddish brown form is predominant.

*A. circellaris* Hufn. Ottershaw, New Haw and Oatlands traps, scarce; Horsell and Pirbright, common. Only locally common elsewhere, probably owing to scarcity of elm.

*A. lychnidis* Schiff. (*pistacina* Fabr.). All traps, abundant. All the usual forms occur.

*Anchoscelis helvola* Linn. All traps, very scarce, except Horsell, common. Ottershaw, once at sugar; Butts Wood, several; Hook Heath, two. Its localisation at Horsell is curious: it is certainly seldom seen in numbers elsewhere, though looked for.

*A. litura* Linn. All traps, common to very common, and elsewhere generally. Examples with extended silver scaling on the base of the forewings are not uncommon.

*Tiliacea citrargo* Linn. All traps, very scarce. Egham, fairly common; Chertsey, at sugar ix.1864 (A.H.C.: *E.M.M.* 1: 192). Chertsey Mead, several at sugar; Ottershaw, fairly common at sugar in some years. Probably exists wherever limes are established.

*T. aurago* Fabr. All traps except Pirbright, very scarce. Egham, one 24.ix.34; Chertsey, at sugar ix.1864 (A.H.C.: *E.M.M.* 1: 192).

*Citria lutea* Stroem. (*flavago* Fabr.). All traps, fairly common to common. Local elsewhere, seldom in numbers.

*Cirrhia icteritia* Hufn. (*fulvago* auctt.). All traps, common to very common. Dominant at reed blossom on Chertsey Mead, and can be bred in numbers from salallows anywhere. The pale unicolorous f. *flavescens* Esp. is common, and f. *aurantia* Tutt, which in colour and markings much resembles *C. lutea*, is frequent.

*C. gilvago* Esp. New Haw trap, several 1950/2; Oatlands, 7.x.55; Egham, fairly common; Chertsey Mead, one on reeds 28.ix.48; Oatlands, rare. Its general rarity in the District is presumably due to lack of its food-plant, wych elm.

*C. ocellaris* Borkh. Oatlands trap, 11 and 14.x.52 (probable breeding ground now destroyed). Chertsey Mead, one male of the mottled form on reed blossom, 17.ix.49, one female of the unicolorous form in a hedge beneath a poplar, 18.ix.49: a few larvae found, but not reared, in 1950. Not seen since, though often looked for. Felling of the old poplars has reduced the species to the verge of extinction.



- Conistra vaccinii* Linn. All traps, very common to common, as elsewhere.
- C. ligula* Esp. All traps, scarce to fairly common. Commoner at sugar and ivy. Obtainable on mild nights through the winter until early February, but not later. The very dark ab. *spadicea* Haw. occurs, as well as bright reddish forms.
- Dasyampa rubiginea* Fabr. All traps, very scarce to scarce, mostly in the spring. Egham, four 1930; Ottershaw, three at sugar 9/11.x.49, one at plum blossom, 30.iii.50; Sheerwater, at sallow, 10.iv.39; Horsell, at sallow 21.iv.11, on a lamp 25.iv.51; Pirbright, many on yew berries. An elusive insect, whose natural habits as a larva are unknown.
- Eupsilia transversa* Hufn. (*satellitica* Linn.). All traps, fairly common to common. General at sallow, but not in numbers here. Very dark forms, with or without a white reniform, occur.
- Lithophane semibrunnea* Haw. All traps, very scarce. Egham, fairly common; Sheerwater, at sallow, 1939; Horsell, at sugar, 1911 and 1951. Certainly a rarity in the District.
- Graptolitha ornitopus* Hufn. Ottershaw trap, 18.iii and 12.iv.52; Oatlands, 23.iii.53; Horsell, 22.iii.54; Pirbright, common. Ottershaw, once on a trunk.
- Xylocampa areola* Esp. All traps, common to fairly common, as elsewhere.
- Lithomoia solidaginis* Hübn. Once only. Sheerwater, at mercury vapour light 27.viii.54 (S. Wakely: *Ent. Rec.*, 66: 255). This must have been one of the unprecedented migration from the Continent, of which nearly twenty other representatives were taken 26.viii/2.ix.54, ranging over nine south eastern and midland counties. Unfortunately, three of the regular traps in the District were not being operated at that time, otherwise more might have been recorded here. The species is resident in Scotland and northern England.
- Xylena vetusta* Hübn. Three records only. Ottershaw trap, 16.iv.52. Egham, two in 1932 and 1934. Clearly very rare, but probably resident.
- Cucullia verbasci* Linn. All traps, very scarce. Sheerwater, larvae occasional on *Verbascum thapsus* Linn. Pirbright, larvae abundant in the garden. The foodplant, *Verbascum* sp., hardly occurs wild in the district.
- C. asteris* Schiff. Once only. Oatlands trap, 28.vi.52. May be resident, as its usual foodplant inland, *Solidago virgaurea* Linn., is fairly common; but no traces of the larva yet found.
- C. umbratica* Linn. All traps, scarce. Ottershaw, once at flowers; Cobbett Hill, a dozen at light, 1955.
- C. chamomillae* Schiff. All traps, scarce to fairly common. Botleys Park, on fence; Woking, 1913; Bagshot, one at light; Camberley, 25.v.51 (R.F.).

- C. absinthii* Linn. Oatlands trap, 23.vii.54, five 11.vii.55. The species is now extending its range in England, but its usual foods, *Artemisia absinthium* Linn. and *A. maritima* Linn., do not occur wild here. Larvae have been found on *A. vulgaris* Linn. in other parts of North Surrey.
- Anarta myrtilli* Linn. New Haw, Horsell and Pirbright traps, very scarce (being mainly diurnal). Egham, one at light 1932; Lucas Green, many at light 22 and 27.viii.55; Hook Heath, at light. Common on all the heaths from May to August, possibly in two broods.
- Panemeria tenebrata* Scop. Egham, fairly common; Brox Copse, one 26.v.47; Sheerwater, fairly common; Lucas Green, several vi.55; Frimley, fairly common. The foodplant, *Cerastium*, seems to be local.
- Pyrrhia umbra* Hufn. All traps, very scarce. Lucas Green, at light 11.vii.55. Not seen otherwise. The foodplant, *Ononis*, is extremely scarce.
- Heliothis dipsacea* Linn. Once only. Horsell trap, 27.viii.52. Probably an occasional visitor only. Earlier records for the District probably refer to the next species, not then distinguished.
- H. maritima* Graslin. Pirbright trap, once. Egham, 18.vii.33, at light; Chobham Common, locally numerous by day and once taken at light; Horsell Common, scarce; Lucas Green, three at light 11.vii.55.
- H. peltigera* Schiff. An occasional immigrant. 1947: Horsell, one on heather, 18.viii; New Haw, one bred from larva found on marigold. 1951: New Haw trap, four in ix.
- H. armigera* Hübn. Once only. New Haw trap, female 24.viii.50. A scarce vagrant.

#### PLUSIIDAE.

- Acontia luctuosa* Esp. Ottershaw trap, 24.v. and 26.vi.52; New Haw, 27.vi.52; Oatlands, 22.vii.52, 10.vi.53; Horsell, 25.vi.53. Probably strays from the chalk. Not seen except in the traps.
- Eublemma parva* Hübn. Once only. Ottershaw trap, a male 24.v.53. This was part of the extraordinary immigration of this species, of which at least 40 were recorded right across southern England between 21.v. and 12.vi.53 (*Ent.*, 87: 266). Three were taken further south in Surrey on 23 and 25.v.
- Jaspidia pygarga* Hufn. (*fasciana* auctt.). All traps, common, as generally elsewhere. Probably a partial second brood in late August in some years.
- Eustrotia uncula* Clerck. All traps, very scarce, except Pirbright, fairly common. Local in wet places on the heaths. Egham, at light 21.v.34; Gracious Pond; Sheerwater, near the Canal, very common 1939/40 (H.G.S.); Chobham, 1912 (H.G.C.: *E.M.M.*, 49: 35).
- Hapalotis venustula* Hübn. Three only. Oatlands trap, two 2 and 10.vii.51, one 24.vii.54. Possibly resident.
- Rivula sericealis* Scop. All traps, common, as generally in damp places. Certainly two broods, and possibly a third in October, 1947.

- Phytometra viridaria* Clerck. All traps, very scarce, except Pirbright, absent; Sheerwater; Chobham Clump, common; elsewhere on the heaths, locally common but mainly diurnal.
- Scoliopteryx libatrix* Linn. All traps, scarce. General at sugar, fallow, light, etc., and as larva, but seldom common in this district. Emerges in July and again in small numbers in the autumn; survivors of both generations reappear in spring.
- Polychrisia moneta* Fabr. All traps, fairly common. Egham, a few; Ottershaw, larvae rather scarce; Sheerwater; Cobbett Hill. A partial second brood, of pale specimens, occurs regularly in August and September. The species was first recorded in Britain in 1890, in Kent. One was taken in a garden at Weybridge on 23.vii.1891, another in 1893, and thereafter annually (*Ent.*, 27: 246, 29: 263).
- Plusia chrysitis* Linn. All traps, common to very common, as generally. Certainly two broods, but usually overlapping.
- P. festucae* Linn. All traps, very scarce, except Oatlands, fairly common. Ottershaw, several times at flowers; Hook Heath, one; Lucas Green, several at light; Ash Vale, once. In two broods. Larvae not found, though searched for.
- P. iota* Linn. Oatlands trap, 22.vii.54, 23.vii.55; Horsell trap, six; Hook Heath, two 1955. Certainly very scarce in the District.
- P. pulchrina* Haw. All traps, very scarce. Occasionally at flowers. Hook Heath, few; Lucas Green.
- P. gamma* Linn. All traps, abundant, though varying in numbers annually. Recruited by immigration, but two and sometimes three broods are produced locally.
- P. acuta* Walker. Once only. Horsell trap, 5.xi.55 (C. de W., *Ent.*, 89: 146). Only two or three other British examples of this tropical species are known. One was taken on the same night at Newbury, Berks. (R. Saundby, *Ent. Rec.*, 68: 27).
- Abrostola triplasia* Linn. Oatlands trap, two or three annually. Longcross, one in 1955 (C.W.P.). Certainly local and rare here.
- A. tripartita* Hufn. All traps, common, as at flowers elsewhere. Two overlapping broods. Very dark examples are numerous.
- Euclidimera mi* Clerck. Walton-on-Thames; Weybridge, by river banks; Sheerwater; Longcross; Pirbright; Frimley; Ash Vale.
- Ectypa glyphica* Linn. Longcross; Sheerwater; Littlefield Common; Pirbright; Frimley; Ash Vale, larvae. More local than the last species, but commoner where found.
- Mormo maura* Linn. All traps, scarce to very scarce. Commoner at rest in outhouses and at sugar in the woods, but not numerous.
- Catocala nupta* Linn. All traps, scarce to fairly common. Widespread on fences and at sugar, but seldom numerous.
- Lygephila pastinum* Treits. All traps, scarce to very scarce. Local in meadows. Sheerwater; Butts Wood; Lucas Green.

## HYPENIDAE.

- Laspeyria flexula* Schiff. All traps, scarce to fairly common. Egham, a few; Sheerwater; Butts Wood; Chobham Sow Moor; Lucas Green.
- Parascotia fuliginaria* Linn. All traps, scarce to fairly common, except Oatlands, five only. First noted from the District in 1904, when several came into lighted rooms at the Royal Staff College, Camberley (Tulloch: *Ent.*, 39: 208). Larvae discovered, also at Camberley, in 1931, feeding upon the fungus *Polystictus versicolor* (Linn.) Fr. growing on an old birch log in a garden (E. E. Green: *Ent.*, 65: 53). Now known to exist almost throughout the District, wherever old logs of birch, Scots pine or beech, bearing suitable fungi, are available. Larvae have been taken at Virginia Water, Ottershaw, Stonehill, Butts Wood, Sheerwater, Camberley, Bagshot, Frimley, Ash Vale, Brookwood; and the moth, apart from captures at light, has been taken flying at Ottershaw, at sugar at Horsell and New Haw Bridge, and at rest in a shed at Sheerwater. For a recent account of its history and wider distribution in England, see H. D. Swain (*Ent. Gaz.*, 4: 186/200).
- Zanclognatha tarsipennalis* Treits. All traps, fairly common to common. Egham, a few; Gracious Pond; Ash Vale. One taken on 27.viii.47 perhaps represented an exceptional second brood.
- Z. nemoralis* Fabr. (*grisealis* Hübn.). All traps, fairly common. General in the woods.
- Herminia barbalis* Clerck. Ottershaw trap, 20.vi and 12.vii.47, 25.vi.52. Not seen otherwise.
- Hyphen proboscidalis* Linn. All traps, fairly common to common, except New Haw, very common. General among nettles. A partial second brood, of small specimens, annually in September.
- H. rostralis* Linn. All traps, very scarce to scarce, in September/October and after hibernation from April until early June. Egham, common; Chertsey, common at sugar ix.1864 (A.H.C.: *E.M.M.*, 1: 192). Ottershaw, much commoner at sugar than at light; Oatlands, hibernates regularly in the house. Very variable, but the unicolorous dull form is most frequent.
- (*Schrankia taenialis* Hübn. (*albistrigalis* Haw.)) Horsell, flying with the next two species on damp heaths, 23.vii.1911 (H. G. Champion: *E.M.M.*, 48: 45). It is, however, not represented among the recorder's specimens now in O.U.M. Not yet rediscovered, despite search.
- S. costastrigalis* Steph. Ottershaw and Horsell traps, very scarce, Oatlands, fairly common. Locally abundant in reed-beds and also in acid bogs on the heaths: Chertsey Mead; Sheerwater; Horsell Common; Brox Pit; Chobham Common. Two broods. Very variable in degree of dark mottling.
- Tholomiges turfosalis* Wocke. Ottershaw, Oatlands and Pirbright traps, very scarce. Very local but abundant in *Molinietum* in acid bogs on the heaths. Sheerwater; Butts Wood; several places on Chobham Common; Horsell Common; Lucas Green. The larva is unknown.

## GEOMETRIDES.

## MONOCTENIIDAE.

- Brephos parthenias* Linn. Common, often abundant, among birch on the heaths everywhere.
- B. notha* Hübn. Ottershaw, one larva beaten from aspen 5.vi.48, and bred; several moths seen in the same thicket in iv.49 and 50, but not since or elsewhere. Its rarity is surprising.
- Alsophila aescularia* Schiff. All traps, common to very common, as elsewhere. Flies from late January to late April.

## GEOMETRIDAE.

- Pseudoterpna pruinata* Hufn. All traps, scarce to fairly common, except Oatlands, very scarce. Common on all the heaths among *Ulex*.
- Hipparchus papilionaria* Linn. All traps, fairly common. Larvae and moths common among birch on the heaths.
- Hemistola immaculata* Thunb. (*vernaria* Hübn.). Ottershaw, Oatlands and Horsell traps, very scarce (eleven in all). Egham, 1.vii.29. The foodplant, *Clematis*, is rare.
- Comibaena pustulata* Hufn. All traps, common to very common, as elsewhere among oak.
- Iodis lactearia* Linn. Ottershaw and New Haw traps, scarce, Oatlands and Pirbright, very scarce. General in the woods, but not common.
- Chlorissa viridata* Linn. Horsell trap, once. Chobham Common, abundant in one small area, where it is attached to *Ulex nanus* Forster. Near Chertsey, common 1863 (A.H.C.: *Week Ent.*, 2: 212).
- Hemithea aestivaria* Hübn. (*strigata* Mull.). Horsell and Pirbright traps, fairly common, Ottershaw and Oatlands, common, New Haw, very common. General, in woods and hedges rather than the heaths.
- Sterrrha muricata* Hufn. (*auroraria* Borkh.). Very local in damp places on the heaths, and not usually common. Butts Wood (R.F.B.); Chobham Common, regularly; Woking, several beaten from bushes by day, 1912 (H.G.C.: *E.M.M.*, 49: 35); Brookwood, one 1.vii.1911 (H.G.C.); near North Camp station, 1932 (R.W.P.); Ash Vale, 28.vii.51 (R.F.).
- Sterrrha seriata* Schrank (*virgularia* Hübn.). Horsell and Oatlands traps, very scarce; Ottershaw and Pirbright, fairly common; New Haw, common. Egham, a few; Chertsey, Ottershaw, Oatlands, many on fences. A partial second brood of small specimens regularly in September.
- S. sylvestraria* Hübn. (*straminata* Treits.). All traps, very scarce, except Oatlands, absent. Sheerwater, 28.vi.42; Horsell, several 21.vi.11, 31.vii.55; Chobham Common, three 1929, 1930, 1945; Cobbett Hill, 19/22.vii.55; Ash Vale, several 28.vii.51. A heath insect, widespread but scarce.
- S. fuscovenosa* Goeze (*interjectaria* Boisd.). All traps, fairly common to common, except Horsell, very scarce. General in hedges and gardens.

- S. subsericeata* Haw. All traps, scarce, except Oatlands and Horsell, very scarce. Egham, scarce. A few small specimens of second brood in late August 1949 and 1952.
- S. inornata* Haw. All traps, fairly common, except Oatlands, very scarce; Chertsey; Byfleet; Sheerwater; Gracious Pond; Cobbett Hill; Ash Vale. In woods.
- S. aversata* Linn. Pirbright trap, common, Ottershaw, and Horsell, very common, New Haw and Oatlands, abundant. General. Very variable, black-banded forms being perhaps the commonest.
- S. biselata* Hufn. All traps, scarce. Egham, a few; Chertsey; Sheerwater. Decidedly rare in this District.
- S. dimidiata* Hufn. Horsell trap, scarce; Ottershaw, New Haw, Oatlands, fairly common; Pirbright, common. Egham, common; Chertsey, Sheerwater. A few small specimens of second brood in late August and September 1949 and 1952.
- S. trigeminata* Haw. Horsell trap, scarce; Ottershaw, Oatlands and Pirbright, fairly common; New Haw, very common. Egham, fairly common; Ottershaw, common on fences; Sheerwater, at sugar; Cobbett Hill.
- S. emarginata* Linn. Oatlands and Horsell, traps, very scarce; Ottershaw, fairly common; New Haw and Pirbright, common. Local, in damp woods. Chertsey, 1863; Virginia Water, a few; Egham, once; Sheerwater; Butts Wood, abundant; Cobbett Hill; Ash Vale. Small specimens in late August 1949.
- Scopula ornata* Scop. Twice only. New Haw trap, 7.vi.48, 5.viii.52. Presumably stragglers from the chalk.
- S. floslactata* Haw. (*remutaria* Hübn.) All traps, scarce, except Horsell, singly; and Oatlands, common. Generally distributed, particularly in woods, but not numerous.
- S. immutata* Linn. Ottershaw trap, 2.viii.46, two 3.viii.54; New Haw, 19.vii.51; Oatlands, 10.vii.52, 1.vii.54, 12.vii.55. Byfleet, 19.vii.02; Ash Vale, 28.vii.51. A marsh species.
- S. marginepunctata* Goeze. Once only. Oatlands trap, 14.ix.53. Usually a coastal species, whose nearest known breeding grounds are beside the Thames Estuary below London.
- S. imitaria* Hübn. Horsell trap, once; Oatlands, very scarce, other traps, scarce. Egham, once; Butt's Wood; Longcross; Chertsey, common 1863. Examples of a second brood occurred in September 1947 and 1949.
- Calothysanis amata* Linn. All traps, very common to abundant, as everywhere. Three broods in some years.
- Cosymbia porata* Fabr. All traps, scarce to fairly common. Byfleet; Horsell; Chobham Common. Two broods, the second consisting of smaller specimens, some with very strong black markings.
- C. linearia* Hübn. Ottershaw trap, three 5 and 25.vi.52, 18.vii.55; New Haw, 10.vi.48, 7.viii.52; Oatlands, 16.vi.51; Horsell, 20.viii.53. Longcross, one on a fence 16.v.48 (R.F.B.), one 1954 (C.W.P.). Clearly rare in the District, despite a fair amount of scattered beech trees.

- C. annulata* Schulze. New Haw trap, 20.viii.51, 12.vii.52; Oatlands, three 5, 12, and 13.viii.52. Horsell Common, one 4.ix.51. The food-plant, maple, hardly exists wild in the District, though cultivated varieties are found in gardens.
- C. punctaria* Linn. All traps, common. General among scrub oak. Two broods, the second being variable in tint of ground-colour and depth of markings.
- C. albipunctata* Hufn. (*pendularia* auctt.). All traps, common to fairly common. Among birch everywhere, abundant on the heaths. Two generations, the second being particularly variable in ground-colour and degree of dark suffusion.
- Anaitis plagiata* Linn. All traps, fairly common, except Horsell, very scarce. Widespread, but seldom numerous, though more so than the next species. Two broods, with occasionally some of a third in October.
- A. efformata* Guen. Horsell and Oatlands traps, very scarce; Ottershaw, scarce. Egham, scarce; an ab. *fimbriata* Cockayne 13.x.47.
- Chesias legatella* Schiff. (*spartiata* Fuesl.). New Haw, very common; Pirbright, common; other traps fairly common. Larvae common on broom everywhere.
- C. rufata* Fabr. All traps, scarce, except New Haw, very scarce. More local than the last species, among broom, but common where found. Horsell, moths and larvae; Sheerwater; Brimshot; Lucas Green; Cobbett Hill; Bagshot, rather common. Appears irregularly from May to August, but apparently only in one generation. A well-marked, pinkish form.
- Nothopteryx carpinata* Borkh. Horsell trap, fairly common; other traps, very scarce. Chertsey; Brox Copse; Sheerwater; Butts Wood. Common among birch, but local.
- Acasis viretata* Hübn. Oatlands, trap, common; other traps, scarce. Egham, once. Two broods.
- Lobophora halterata* Hufn. All traps, very scarce to scarce. Virginia Water; Chertsey, one on a fence; Brox Copse, a few among aspen; Weybridge, common twenty years ago, now quite rare (J.L.M.); Ashley Park, Walton, formerly common on trunks (J.L.M.).
- Mysticoptera sexalisata* Hübn. All traps, scarce. Egham, a few vi.33; Longcross, on a trunk 2.vi.46; Sheerwater, 1899, 1901, 1955; Butts Wood; Lucas Green; Cobbett Hill. Apparently widespread, but scarce.
- Triphosa dubitata* Linn. Ottershaw trap, 10.vi.51; Pirbright, very scarce. Egham, one at light 9.vii.33; Stonehill, 11.v.49 (R.F.B.); Chertsey, 17.vii.1863 (A.H.C.: *Week. Ent.*, 2: 212); Oatlands, formerly, but not seen for some years (J.L.M.). Curiously rare here.
- Calocalpe cervinalis* Scop. (*certata* Hübn.). All traps, very scarce to scarce. Egham, one; Ottershaw, flying round a barberry bush in a garden; Horsell, one in 1948 (C. de W.). The foodplant occurs outside gardens only as an occasional escape.



- C. undulata* Linn. All traps, very scarce, except Pirbright, common. Chertsey, 1863 (A.H.C.: *Week. Ent.*, 2: 212); Weybridge, one in 1926 (J.L.M.); Sheerwater, larvae 28.vii.29, 12.ix.36, moth 18.vi.31 (H.G.S.); Butts Wood, several (R.F.B.); Lucas Green. Local among dense sallows.
- Philereme vetulata* Schiff. Ottershaw trap, 23.vii.54; Oatlands trap, 1 and 7.vii.52, 24.vii.54, 25.vii.55. Not seen otherwise.
- P. transversata* Hufn. (*rhamnata* Schiff.). Ottershaw trap, 7.viii.53; Oatlands, two 20.vii.52, two 6.viii.53, 24.vii.54, 24.vii.55; New Haw, 10.vi.48. Not seen otherwise. The rarity of this and the last species is no doubt due to scarcity of the foodplant, *Rhamnus catharticus* Linn.
- Ecliptopera silaceata* Schiff. All traps, common to very common, as everywhere among *Epilobium*. Two broods.
- Lygris prunata* Linn. Three records only. Oatlands, in 1926 but none since (J.L.M.); Weybridge, before 1904 (in O.U.M. *e. coll.* Robertson); Sheerwater, 21.vi.41 (H.G.S.).
- L. testata* Linn. Horsell, New Haw, Pirbright traps, scarce; Ottershaw, very scarce. Common in wet places all over the heaths.
- L. mellinata* Fabr. (*associata* Borkh.). All traps, fairly common. General in hedges and gardens.
- L. pyraliata* Schiff. (*dotata* auctt.). Horsell trap, five; New Haw, Oatlands, Pirbright, scarce. Egham, common; Longcross; Cobbett Hill, scarce. Certainly local.
- Cidaria fulvata* Forst. Ottershaw and Horsell traps, very scarce, New Haw and Pirbright, scarce. Oatlands, seems to have died out for about ten years (J.L.M.); Longcross; Chobham Sow Moor, several.
- Electrophaës corylata* Thunb. Oatlands, three, other traps scarce to fairly common. Fairly common generally in woods and hedges.
- Dysstroma truncata* Hufn. All traps, common to very common, as generally. Two broods, the first much less numerous than the second. Variable, dark forms being in the majority and the reddish f. *commanotata* Haw. occasional.
- Chloroclysta miata* Linn. Twice only. Butts Wood, bred from larva 24.viii.47 (R.F.B.); Egham, one at light 15.ix.32 (C. de W.).
- Thera variata* Schiff. Oatlands trap, 10.v.52; Horsell trap, 18.ix.51, 26.vi.52. Possibly overlooked, but its preferred food, spruce, is rare.
- T. obeliscata* Hübn. All traps, very common, except Horsell, abundant. Everywhere among Scots pine. Two broods. Melanic forms are common, and there is a pink form much resembling *T. firmata*.
- T. firmata* Hübn. Once only. Cobbett Hill, 24.x.55 (A.J.S.). Its rarity is remarkable.
- Lampropteryx suffumata* Schiff. Longcross, one in 1951 (C.W.P., confirmed in lit.). Looked for elsewhere, but not found.
- Xanthorhoe quadrifasciata* Clerck. Ottershaw trap, 12.vii and 5.viii.53; Horsell, 16.vii.54; Pirbright, 16.vi.47. Egham, 10.vii.26 (C. de W.: *Ent.*, 60: 26) and four 1929/34; Sheerwater, 15.vii.55 (S.W.); Chertsey, 21.vii.1864 (A.H.C.: *E.M.M.*, 1: 192).



- X. ferrugata* Clerck (Dark Twin-spot Carpet). All traps, common to very common, as elsewhere in hedges and woods. Two broods.
- X. spadicearia* Schiff. (Red Twin-spot Carpet). All traps, very scarce to scarce. Lucas Green, 22.viii.55; Cobbett Hill, 12.viii.55. Two broods. A decided rarity here.
- X. designata* Rott. Oatlands trap, twice; Ottershaw trap, seven; New Haw, Horsell and Pirbright, scarce. Egham, few; Byfleet, Butts Wood, and a few in the woods: certainly rare here. Two broods. An aberration with the central band narrowed and blackened at Ottershaw, 24.v.52 (R.F.B.).
- X. montanata* Borkh. All traps, scarce to fairly common. General in woods and hedges, but nowhere abundant.
- X. fluctuata* Linn. All traps, very common, except Horsell, fairly common. General, except on the heaths. Two broods. *Ab. costovata* Haw. at Oatlands on fences 15.vi.30 and 20.vi.53 (J.L.M.).
- Colostygia pectinataria* Knoch (*viridaria* Fabr.). Oatlands trap, once, Ottershaw and New Haw, scarce. Chertsey, Byfleet, Cobbett Hill, common in marshes, and occasional in the woods. A partial second brood of small specimens in September.
- C. didymata* Linn. Two records only. Egham, at light 1.vii.29; Oatlands trap, 10.vii.54. May be overlooked, but is certainly rare.
- Rhodometra sacraria* Linn. An occasional immigrant, which in 1947 certainly bred in the District. 1947: Virginia Water, two males and a female in the dry bed of the lake 10/11.viii (A. A. Moppett: *Ent.*, **80**: 220), two 11.x in the same place (R.F.B.); Ottershaw, one at light 7.ix and three in an overgrown field nearby (R.F.B.). 1949: New Haw trap, 20.ix. 1950: New Haw trap, 20.viii; Ash Vale, one 21.viii in the Army School of Health (J. F. Burton: *Ent.*, **84**: 69). 1951: Oatlands trap, one 31.vii.
- Ortholitha bipunctaria* Schiff. Once only. Ottershaw trap, 18.vii.46. A stray from the chalk.
- O. mucronata* Scop. (*plumbaria* Fabr.). Ottershaw trap, 19.viii.53, two 13/16.vii.55, New Haw, 14.vi.50, Horsell, 26.vi.52. Horsell Common, 25.vii.45, 1.viii.50 (R.E.E.); Chobham Common, north side, two 1.viii.49, one 23.viii.53 (R.F.B.), one 1951 (C.W.P.); Littlefield Common, 1955 (A.J.S.); Lucas Green, one at light 11.vii.55 (R.F.B.). A characteristic heath insect, curiously scarce.
- O. chenopodiata* Linn. (*limitata* Scop.). Horsell trap, very scarce; other traps, fairly common to common. General away from the heaths but not numerous.
- Larentia clavaria* Haw. (*cervinata* auctt.). Horsell and Pirbright traps, very scarce; other traps, scarce. Egham, once. Cobbett Hill, at light. *Malva* sp. are not common wild, and larva seems mainly to feed on garden hollyhocks.
- Orthonama lignata* Hübn. Five records only. Egham, two 1929, one 1933. Oatlands trap, 22.vi.52, 11.vi.53. Probably resident in the river marshes.

- Oporinia autumnata* Borkh. Oatlands trap, very scarce; other traps, common. Chobham Common, bred in plenty from birch, among which the species is widespread.
- O. dilutata* Schiff. All traps, common to very common, as everywhere.
- O. christyi* Prout. Four have been detected at Horsell and Ottershaw traps and at light at Egham. Doubtless overlooked, but certainly much scarcer than the last two species.
- Asthenia albulata* Hufn. (*candidata* Schiff.). Ottershaw, Oatlands and Horsell traps, very scarce. Longcross; Butts Wood, fairly common.
- Hydrelia flammeolaria* Hufn. (*luteata* Schiff.). All traps, very scarce to scarce. Among *Alnus*, not common. Egham, once; Ottershaw Queenwood; Longcross; Butts Wood; Chertsey, 27.vii.1863 (A.H.C.: *Week. Ent.*, 2: 238).
- Euchoeca nebulata* Scop. (*obliterata* Hufn.). Ottershaw trap, very scarce, Oatlands and Pirbright, fairly common. Locally common wherever there is *Alnus*.
- Operophtera fagata* Scharf. (*boreata* Hübn.). Oatlands trap, very scarce; other traps, common. General among birch: unusually abundant in 1955.
- O. brumata* Linn. All traps, common to very common, as elsewhere.
- Pelurga comitata* Linn. All traps, scarce. Common at dusk in lanes and gardens. Very dark specimens occur.
- (*Mesotype virgata* Rott.). One specimen in O.U.M., Chobham, 18.vii.1914 (R.J.C.). Not seen since. Usually on coastal sand-dunes or downland.
- Epirrhoë galiata* Hübn. Horsell trap, 3.ix.53. Woking, at light 9.v.1912 and bred 4.vi.1912 (H.G.C., *E.M.M.*, 49: 35). May be overlooked, but is certainly rare.
- E. rivata* Hübn. Egham, one 23.v.30; Hermitage Wood, two 1.vii.1911 (in O.U.M.: R.J.C.). Probably overlooked.
- E. alternata* Müll. (*sociata* Borkh.). All traps, fairly common; abundant at Oatlands. Common on the heaths and in thickets. Two broods.
- Euphyia unangulata* Haw. Oatlands trap, very scarce, Horsell, scarce, Ottershaw, fairly common, New Haw and Pirbright, common. General near the heaths: commoner 1946/7 than now. Emerges erratically and is probably partially double-brooded.
- E. picata* Hübn. Longcross, one at dusk 24.vi.54 (R.F.B.); Chobham Common, three at mercury vapour light 10, 12, 16.vii.52 (E.H.W.); Chobham, 10.vii.11 (R.J.C.); Woking, 20.vii.11 (R.J.C.); Lucas Green, at light 15.vii.55 (C. de W.). Certainly rare now, though apparently common near Chertsey in 1863 and 1864 (A.H.C.: *Week. Ent.*, 2: 212, *E.M.M.*, 1: 192).
- E. bilineata* Linn. All traps, very scarce to scarce. Flies commonly at Ottershaw, as elsewhere, after dark, but seldom approaches light.
- E. cuculata* Hufn. Ottershaw trap, 25.vii.52; Oatlands trap, eleven in all; Horsell 6.vii.53, 4.viii.54, one 1955. Oatlands, one in garden 1947. Apparently resident, though usually a chalk insect.

- Eulype hastata* Linn. Two records only. Sheerwater, 4.vi.40 (H.G.S.); Longcross, one 1945 (C.W.P.). A birch feeder, which should be commoner here.
- Mesoleuca albicollata* Linn. Ottershaw trap, 14.vii.49; Horsell, 24.vii.52; Pirbright, very scarce. Scattered records from Oatlands, Weybridge, Byfleet, Sheerwater, Longcross, Gracious Pond, Woking and Cobbett Hill, but certainly scarce.
- Lyncometra ocellata* Linn. All traps very scarce, except Oatlands, absent. Locally fairly common on the heaths. Two broods.
- Plemyria bicolorata* Hufn. Ottershaw trap, twice; other traps scarce, except New Haw, fairly common. Local among *Alnus*. Ottershaw, Queenwood; Sheerwater; Butts Wood.
- Melanthia procellata* Fabr. Once only. Weybridge, 1932 (J.L.M.).
- Perizoma affinitata* Steph. Twice only. Cobbett Hill, 24.vii.55 (A.J.S.); Ash Vale, 28.vii.51 (R.F.).
- P. alchemillata* Linn. All traps, scarce to very scarce. Egham, once; Sheerwater; Chobham Sow Moor, common in 1949 but usually scarce; Lucas Green; Cobbett Hill.
- P. flavofaciata* Thunb. (*decolorata* Hübn.). Horsell trap, very scarce; Ottershaw, Oatlands, Pirbright, scarce. Egham, once; Chertsey, common 1863; Ottershaw, occasionally at dusk. A *Lychnis* feeder, not common anywhere here.
- P. albulata* Schiff. All traps, scarce to very scarce. Egham, few; Sheerwater. The foodplant, *Rhinanthus cristagalli* Linn., is very local.
- P. bifasciata* Haw. Ottershaw trap, regularly but very scarce; New Haw, scarce. The foodplant, *Bartsia odontites* Huds. is widespread.
- Hydriomena furcata* Thunb. (*sordidata* Fabr.). All traps, scarce. Local among sallows, but abundant where found. Black examples are rare.
- H. coerulata* Fabr. (*impluviata* Hübn.). All traps, very scarce to scarce. Locally common wherever there is *Alnus*.
- (*H. ruberata* Frey.). Once only. Brookwood, in a street lamp. 5.vi.1912 (H.G.C.: *E.M.M.*, 49: 35). Rare in Southern England, usually among old willows: not yet rediscovered in the District.
- Earophila badiata* Hübn. Oatlands trap, singly; Horsell, very scarce; Ottershaw and Pirbright, scarce. Egham, common. The foodplant of this and the next, *Rosa* sp., is scarce in most of this District.
- Coenotephria derivata* Schiff. (*nigrofasciaria* Goeze.). One record only. Ottershaw trap, 13.v.51.
- Nyctosia obstipata* Fabr. (*fluviata* Hübn.). A frequent immigrant. 1947: Ottershaw trap, 27.viii; Horsell Common, on a grass stem 17.viii (C. de W.; *Ent.*, 80: 234); Worplesdon Hill, at light 25.iv., 12 and 17.viii (Howell: *Ent.*, 81: 72). 1948: Chertsey Mead, one on reed blossom, 2.x. (R.F.B.: *Ent.*, 82: 19). 1950: Horsell, on a street lamp 27.viii. (R.E.E.); New Haw trap, 21.v., 23.viii. 1952: New Haw trap, 5.viii; Oatlands trap, four end July, one 30.viii. 1953: Horsell trap, 8.xii (a very late date); Oatlands trap, three end July. 1954: Ottershaw trap, female 1.xi; Horsell trap, 5.x.

- Horisme vitalbata* Hübn. Ottershaw trap, 30.viii.53, 22.viii.55; New Haw, 9.viii.50; Oatlands, 23.viii.51, 5.viii.53; Horsell, 25.viii.53; Pirbright, several. Camberley, 30.vii.50 (R.F.). A *Clematis* feeder, like the next species barely established here.
- H. tersata* Hübn. Ottershaw trap, 15.viii.54; Oatlands, 20.vii.53, 2.viii.54, two 19.vii.55; Horsell trap, 20.vii and 3.viii.54.
- Eupithecia centaureata* Schiff. (*oblongata* Thunb.). All traps, fairly common to common, except Oatlands, very common. General. Bred from larvae on golden-rod and ragwort. Two broods.
- E. pulchellata* Steph. All traps, very scarce. The foodplant, *Digitalis purpurea* Linn. is scarce, but the larvae no doubt breed in garden plants.
- E. linariata* Fabr. Horsell trap, once; Ottershaw, New Haw and Oatlands, very scarce. Horsell Common, 4.ix.51; Chobham (Fairoaks), moths bred in 1954 from *Linaria vulgaris* Mill., which is local in the District; Egham, three 1929; Chertsey, 2.vii.1867 (A.H.C.: *E.M.M.*, 4: 191).
- E. tantillaria* Boisd. (*pusillata* Fabr.). Ottershaw trap, 14.v.52, 22.v.53, 14.v.49; Horsell, 20.v.53; Oatlands, fairly common. The foodplant, spruce, is scarce and consists mainly of scattered large trees.
- E. indigata* Hübn. Ottershaw trap, 26.v.50, 13.v.52, 3.vi.54; Horsell, three 20.v.52, three 30.v.54, one v.55; Oatlands, two or three annually. Egham, 15.vi.36. A pine feeder, which should be commoner than these records suggest.
- E. venosata* Fabr. Ottershaw trap, three 24.v/3.vi.52, which may have bred on cultivated pinks in the garden; Oatlands, 11.vi.55.
- E. pimpinellata* Hübn. Ottershaw, one identified by D. S. Fletcher, bred 12.viii.54 from larvae found the previous October on *Solidago virgaurea* Linn. I have never seen the usual foodplant, *Pimpinella saxifraga* Linn. in the District.
- E. assimilata* Doubl. Horsell trap, very scarce; Oatlands, scarce; Ottershaw and New Haw, fairly common. Egham, two 1929; New Haw bridge. Two broods.
- E. absinthiata* Clerck. Horsell trap, scarce; Ottershaw, New Haw and Oatlands, fairly common. Egham, a few; Ottershaw, bred from *Solidago* and *Senecio*; Brox, at dusk; Chobham Common; Cobbett Hill.
- E. goossensiata* Mab. Ottershaw, Oatlands and Horsell traps, very scarce. Horsell Common, numerous by day, 31.vii.55; Chobham Common, many 1947/9; Lucas Green, at light 22.vii.55; Cobbett Hill. Is very distinct here both in habits and appearance from the last species, with which it is sometimes said to be identical.
- E. albipunctata* Haw. (*tripunctaria* H.-S.). All traps except Pirbright, scarce. Chobham Sow Moor, many bred from *Angelica*, including one black ab. *angelicata* Barrett. Two broods.
- E. vulgata* Haw. All traps, fairly common to common, as generally. Only one brood has been noticed here.

- E. lariciata* Frey. Oatlands trap, 25.vi.51, two 5.viii.52, 22.vi.55; Horsell trap, 26.v.52. Probably overlooked, though there is not much larch in the District.
- E. castigata* Hübn. Ottershaw, New Haw, Oatlands and Horsell traps, scarce. Egham, two 1931; Ottershaw Church Common, many at dusk 19.vi.54 and bred from larvae on *Solidago*; Byfleet.
- E. arceuthata* Frey. Horsell trap, scarce; Oatlands, becoming commoner; Ottershaw, common. Egham, one 22.vi.1931; Ottershaw, breeds commonly on a hedge of *Cupressus lawsoniana* Murr. The natural foodplant, juniper, does not occur wild in the District.
- E. satyrata* Hübn. Ottershaw trap, 20.v.53 (*teste* D. S. Fletcher), 31.v.52, 19.vi.54; Horsell trap, 7.v.54; Chobham Common, at light (R.F.).
- E. succenturiata* Linn. Horsell trap, 29.vi.53; Ottershaw, New Haw, Oatlands, scarce. Egham, one 10.vii.46; Longcross, 4.vii.55; Gracious Pond, 15.vii.55; Lucas Green, several at light, vii.55.
- E. icterata* Vill. (*subfulvata* Haw.). Horsell trap, scarce; Ottershaw, New Haw and Oatlands, common. Egham, a few.
- E. haworthiata* Doubl. Ottershaw trap, 26.vi.52; Oatlands, 26.vi.53, 25.vii, 28.viii.54, 10.vii.55, and frequently many years ago around garden *Clematis*; Horsell, 25.vi.53, 21.vi.54.
- E. valerianata* Hübn. Ottershaw trap, twice; Oatlands trap, five, 1952/4. Chobham Sow Moor, common 23.vi.50 and later years among *Valeriana dioica* Linn.; Lucas Green, 14.vi.55.
- E. plumbeolata* Haw. Horsell trap, 23.vi.53. Egham, at light 15.vi.36. These records are surprising, as the usual foodplant, *Melampyrum*, is very scarce in the District.
- E. tenuiata* Hübn. Ottershaw trap, 28.vii.47, viii.52; Oatlands, 15.vii.53, 12.viii.54, 17.vii.55 (*teste* D. S. Fletcher); Horsell, 14.vi.45. Ottershaw Park, a few bred from sallow catkins, vii.55 (R.F.B.), but larvae seem to be local.
- E. fraxinata* Crewe. Oatlands trap, 18.v.53, 12.viii.55 (*teste* D. S. Fletcher); Ottershaw trap, 15.vi.55.
- E. nanata* Hübn. All traps, fairly common to common. Dominant among heather everywhere. Two, possibly three, broods.
- E. abbreviata* Steph. All traps, scarce to fairly common. Egham, a few. General in woods. Black specimens are frequent.
- E. exigua* Hübn. All traps, scarce to fairly common. Egham, a few; Lyne, on fences; Cobbett Hill.
- E. sobrinata* Hübn. Ottershaw trap, 13.vii.47; Oatlands, several viii.55. Egham, 21.vii.29. The usual food, juniper, does not occur wild.
- E. pini* Linn. (*togata* Hübn.). Once only. Oatlands trap, 8.vii.52. Possibly breeds in the cones of ornamental spruces in gardens.
- E. subnotata* Hübn. Ottershaw trap, very scarce (nine); Oatlands trap, five. Egham, one 1930.
- E. subumbrata* Schiff. (*scabiosata* Borkh.). Ottershaw trap, 23.vi.46, 23.vi.52; New Haw, 30.vi.48; Oatlands, 14.vi.52, 6.viii.53, 17 and 18.vi, 11.viii.54, 25.vi.55; Horsell, 19 and 29.vi.53. Lucas Green, one at light 11.vii.55 (R.F.B.).

*Gymnoscelis pumilata* Hübn. All traps, fairly common to common. Abundant among *Ulex* on the heaths. Three broods probably, as specimens may be found from early March until October.

*Chloroclystis coronata* Hübn. Ottershaw and Horsell traps, very scarce; Oatlands, scarce. Longcross.

*C. rectangulata* Linn. All traps, common. Egham, few. Ottershaw, larvae in apple blossom. The black ab. *nigrosericeata* Haw. is predominant.

*Anticollis sparsata* Treits. Oatlands trap, 13.vii.54. Byfleet, Sheerwater, Woking, by canal, moths 1910 and 1911 (H.G.C.), and larvae in recent years on *Lysimachia vulgaris* Linn.; Butts Wood, one flying 30.vi.53; Longcross, one in 1954 (C.W.P.) (*teste* G. A. Ford).

*Abraxas sylvata* Scop. Three only. New Haw trap, 30.vi.52; Oatlands trap, 30.vi.52; Horsell trap, 11.vii.55. These isolated captures, two of them on the same night, suggest migration rather than residence.

*A. grossulariata* Linn. New Haw and Oatlands traps, very scarce. Egham, a few; Chertsey, one larva; Sheerwater, fairly frequent in garden; seems to occur only on the fringe of the District, and off the Bagshot Sand. Ab. *lacticolor* Raynor on a trunk at Oatlands, 12.viii.1932.

*Lomasipilis marginata* Linn. All traps, common to very common, as elsewhere. Two broods, often overlapping.

*Ligdia adustata* Schiff. Ottershaw, New Haw and Oatlands traps, very scarce; Pirbright, scarce; Egham, once; Chertsey, 14.viii.1865 (A.H.C.: *Week Ent.*, 2: 238); Lucas Green, 27.viii.55. The food-plant, spindle, is scarce, but there are cultivated forms in gardens. Two broods.

*Perconia strigillaria* Hübn. Ottershaw and New Haw traps, very scarce; Horsell and Pirbright, fairly common. Locally very common on all the heaths.

*Aspitates ochrearia* Ross. Three only. New Haw trap, 25.viii.54; Longcross, 1948 and 1949 (C.W.P., confirmed *in lit.*). Probably not resident.

*A. gilvaria* Fabr. Longcross, one 1949 (C.W.P., confirmed *in lit.*). Probably a stray from the North Downs.

*Dyscia fagaria* Thunb. Horsell and Pirbright traps, very scarce. Egham, once at light. Horsell Common; Gracious Pond; Chobham Clump; Cobbett Hill. In short heather, seldom numerous.

*Gnophos obscurata* Schiff. Ottershaw, Horsell and Pirbright traps, singly. Horsell and Chobham Commons, locally numerous; Cobbett Hill. A dark form.

*Bapta bimaculata* Fabr. Ottershaw trap, three 13/23.vi.55; Oatlands, 15 and 17.v.52, 24.iv and 26.v.54; Horsell, 10.vi.53. Ottershaw, one 30.v.47 at dusk among beech trees; Byfleet, 1.vi.01 (*S.L.F.S.*, 1901: 16); Cobbett Hill, one at light, 1955. Certainly rare.

*B. temerata* Hübn. All traps, fairly common, except Pirbright, very scarce. General near woods, but not numerous.

- Cabera pusaria* Linn. All traps, common to very common, as elsewhere. Two broods, often overlapping.
- C. exanthemata* Scop. Horsell trap, scarce; Ottershaw, New Haw and Pirbright, fairly common; Oatlands, common. Very common among sallows in wet places, less widespread than the last. Two broods.
- Ellopiia fasciaria* Linn. (*prosapiaria* Linn.). Horsell trap, fairly common, other traps, scarce. Locally common among large Scots pine. Egham, a few; Longcross; Sheerwater; Cobbett Hill. Dark forms occasional.
- Campaea margaritata* Linn. All traps, fairly common to common. General.
- Semiothisa alternaria* Hübn. Ottershaw trap, 13.vii.46, 22.vi.53; New Haw, annually 1948/52; Oatlands, 4.viii.52; Horsell, two 12 and 27.vi.52. Sheerwater, one at light 19.viii.55 (S.W.). A record of *Macaria notata* near Chertsey, 30.vi.1863, probably refers to this species (A.H.C.: *Week. Ent.*, 2: 212). A heath insect, but surprisingly scarce. Two broods, the second much darker.
- S. liturata* Clerck. Horsell trap, common, other traps, scarce. Locally abundant among old Scots pine. Two broods. The dark ab. *nigrofulvata* Coll. was taken at Oatlands, 10.vi.51.
- Itame wauaria* Linn. Oatlands and Horsell traps, scarce; other traps, fairly common to common. Egham, twice; Ottershaw, larvae on currant bushes; Butts Wood.
- I. fulvaria* Vill. (*brunneata* Thunb.). Once only; here a scarce vagrant, though resident in Scotland. Ottershaw trap, male 11.vii.55 (*Ent.*, 88: 210).
- Chiasmia clathrata* Linn. Horsell trap, very scarce; Ottershaw and Oatlands, fairly common; Pirbright, common; New Haw, abundant. General away from the heaths. Two broods.
- Theria rupicaparia* Hübn. Ottershaw and Oatlands traps, singly; Horsell, scarce. Egham, once at light; Ottershaw, fairly common on hawthorn hedges, as probably elsewhere, but the moth is very sluggish.
- Erannis aurantiaria* Esp. All traps, scarce to fairly common; New Haw, common. Egham, very common; Byfleet; Weybridge.
- E. marginaria* Borkh. All traps, fairly common to common. Abundant in the woods. Very variable, dusky forms being numerous.
- E. leucophaearia* Schiff. All traps, common to very common. Abundant in the oak woods. The black f. *merularia* Weymer and black and white f. *marmorinaria* Esp. are particularly common.
- E. defoliaria* Clerck. All traps fairly common to common, except New Haw, abundant; but varies greatly in numbers from year to year. Unicolorous brown and dusky forms are common.
- Plagodis dolabraria* Linn. Pirbright trap, very scarce; other traps, fairly common. Egham, a few; Hook Heath, one; Lucas Green; Cobbett Hill. Mainly a woodland species.



- Ennomos quercinaria* Hufn. Oatlands trap, 1.viii.53, 4.viii.55. Weybridge, one in 1931 (J.L.M.); Egham, at light 11.ix.31 (C. de W.); Longcross, two or three in 1952/4 (C.W.P.). Clearly rare, in marked contrast to the other "Thorns".
- Deuteronomos alniaria* Linn. All traps, common, as generally.
- D. fuscantaria* Haw. All traps, fairly common to common, as generally.
- D. erosaria* Borkh. All traps, common to very common. General. A small pale form appears in July and early August, then after a distinct gap a large richly coloured form from late August to October. These are not successive generations, and the explanation of this curious situation is still unknown.
- Selenia bilunaria* Esp. All traps, common to very common, as elsewhere. Two broods, very distinct in size and colour.
- S. lunaria* Schiff. Ottershaw trap, 25.v.52, 5.vi.54, 6 and 15.vi.55; New Haw, 16.v.48, 7.viii.51; Oatlands, 18.v.53; Horsell, 19.v.52, two 11.vi.53, one vi.55; Pirbright, very scarce. Only at traps.
- S. tetralunaria* Hufn. All traps, scarce to fairly common, but few in 1954 and 1955. Egham, twice; Byfleet; Stonehill; Butts Wood. Two broods, very distinct in size and colour.
- Apeira syringaria* Linn. New Haw trap, common; other traps, scarce to very scarce. Egham, once; Chertsey; Sheerwater; Gracious Pond; Chobham Common, larvae; Cobbett Hill. A partial second brood of small examples appears in September in most years.
- Gonodontis bidentata* Clerck. All traps, common to fairly common, as generally. Dark forms predominate, but the true melanic is not seen.
- Crocallis elinguaris* Linn. All traps, common. General. Examples with a speckling of dark scales are frequent, and in two from Ottershaw all wings are grey except for the cross lines (R.F.B.: figured *S.L.E.S.*, 1953/4, Plate II: 6).
- Colotois pennaria* Linn. All traps, common to very common, as everywhere.
- Opisthograptis luteolata* Linn. All traps, very common to abundant, as elsewhere. At least two broods, usually overlapping.
- (*Cepphis advenaria* Hübn.). Chertsey, one flying along a hedge 27.v.1864 (A.H.C.: *E.M.M.*, 1: 192). No later record. The usual foodplant elsewhere in Surrey, *Vaccinium myrtillus* L., may still exist nearby on St. Ann's Hill.
- Epione repandaria* Hufn. (*apiciaria* Schiff.). All traps, scarce, except New Haw, common. Egham, once; Longcross; Chertsey; Byfleet, larvae; Sheerwater; Woking; Hook Heath, one; Cobbett Hill. Mainly by the rivers and canal. Appears from late June to October, and is probably partially double-brooded.
- Pseudopanthera macularia* Linn. Not seen in the traps. Longcross, scarce; Childown, very locally by the roadside; Byfleet; Cobbett Hill, one. Certainly local.
- Lithina chlorosata* Scop. (*petraria* Hübn.). All traps, fairly common to common. Dominant among bracken everywhere.



- Pachynemia hippocastanaria* Hübn. Oatlands, trap, twice; other traps, scarce, except Horsell, common. Abundant on all the heaths. Two broods and a partial third.
- Ourapteryx sambucaria* Linn. All traps, fairly common to common. General off the heaths. A specimen 11.x.50 at New Haw.
- Phigalia pedaria* Fabr. All traps, fairly common to common, as generally in the woods. The black ab. *monacharia* Staud. is scarce.
- Apocheima hispidaria* Fabr. All traps, usually scarce or very scarce, but very common in 1948. In that year fifteen were taken at a paraffin lamp in a wood near Gracious Pond in half an hour. Egham; Horsell; Ottershaw (Woodlands Close), fifteen at mercury vapour light in 1954, two in 1955; Hermitage Bridge.
- Lycia hirtaria* Clerck. All traps, common to very common, all males, but little seen otherwise in any stage. Egham, once. Unicolorous black-brown examples occur rarely.
- Biston strataria* Hufn. All traps, common to very common: no females. The moth has not been seen otherwise, except occasionally on fences, but larvae can be beaten from oak generally. Very variable. Unicolorous dark brown specimens are rare, and very pale forms rather commoner.
- B. betularia* Linn. All traps, abundant; appearing in one generation from mid-May to early August. Larvae common generally, especially on birch; moth seldom seen except at light. At Ottershaw, 1946-55, the black f. *carbonaria* Jordan accounted for 80% of the total trapped, the typical form for 14%, and f. *insularia* Th.-Mg. for 6%. An example of f. *carbonaria* with a broad yellow band on the abdomen has occurred at Ottershaw, and an unnamed ab. of f. *insularia* from Oatlands (J.L.M.) was figured (*S.L.E.S.*, 1952/53: Plate III, 5).
- Hemerophila abruptaria* Thunb. Horsell trap, once; Oatlands and Pirbright, very scarce; Ottershaw and New Haw, fairly common. Egham, once; Stonehill. Not generally common in the District.
- Boarmia roboraria* Schiff. All traps, scarce to fairly common. Egham, twice; Sheerwater; Butts Wood; Ottershaw, on trunks. There is a strong tendency towards melanism, and a true melanic was taken at Ottershaw 17.vii.51 (R.E.R.P.).
- B. punctinalis* Scop. (*consortaria* Fabr.). All traps, fairly common to common. General among birch. One, of a second brood, 18.viii.52. (*Cleora lichenaria* Hufn.). Chertsey, 20.vii.1863 (A.H.C.: *Week. Ent.*, 2: 212). No later record.
- C. rhomboidaria* Schiff. (*gemmaria* Brahm.). All traps, common to very common, as elsewhere. A few dwarf specimens occur in most years in September and October.
- C. repandata* Linn. All traps, common, as generally, especially among heather, where the larvae may be found commonly in spring. Melanic forms are occasional.
- Selidosema plumaria* Schiff. (*ericetaria* Vill.). Chobham Clump, very local but common; Butts Wood, scarce.

*Ectropis bistortata* Goeze. All traps, fairly common to common. Generally abundant in the woods. Two full broods and usually a few small examples of a third in the autumn. Both very pale and melanic forms occur.

*E. crepuscularia* Hübn. Ottershaw trap, 26.iv.48; Oatlands, 16.v.53, 3.vi.54, 20.vi.55; Horsell, 23.v.55. Egham and Virginia Water, few (C. de W.); Longcross, sometimes common (C.W.P.); Chobham, 20.vi.48 (R.E.E.); Pirbright, not uncommon on trunks (H.B.L.). Clearly local and much scarcer than the last species.

*E. extersaria* Hübn. (*luridata* Borkh.) Oatlands trap, twice (and pre-war records); Ottershaw, very scarce. Virginia Water, 24.v.33 (C. de W.); Gracious Pond, 9.vii.55 (R.F.); Cobbett Hill, fairly common at light vi.55 (A.J.S.).

*E. consonaria* Hübn. Egham, at light, 12.vi.29 (C. de W.); Bagshot, rather numerous in a wood since felled (R.W.P.). Possibly overlooked, but clearly very local.

*Aethalura punctulata* Schiff. All traps, fairly common to common. Common among birch everywhere.

*Ematurga atomaria* Linn. Horsell trap, once only. Light seems to have no attraction for it, but it is dominant on all the heaths, flying by night as well as by day, and is frequent elsewhere. A partial second brood in August. Melanic male specimens are occasional, and females with strong black markings on a white ground rather more frequent.

*Bupalus piniaria* Linn. All traps, scarce to very scarce. Longcross; Childown; Sheerwater; Horsell Common; Cobbett Hill; Ash Vale. Abundant among large Scots pine, but not everywhere.

## PSYCHES.

### LIMACODIDAE.

*Apoda avellana* Linn. (*limacodes* Hufn.). Ottershaw trap, very scarce, New Haw and Pirbright, scarce. Byfleet, larva, 8.ix.35; Woking, larva 1910 (H.G.C.); Lucas Green, one at light, 20.vii.55 (C. de W.).

### ZYGAENIDAE.

*Zygaena filipendulae* Linn. Egham, common; Ashley Park, Walton, formerly common (J.L.M.); Sheerwater. Very local.

*Z. lonicerae* Esp. Egham, scarce (C. de W.). The only station yet known.

*Z. trifolii* Esp. Ashley Park, Walton, formerly common (J.L.M.); Byfleet, 19.vii.02 (*S.L.E.S.*, 1902: 56) and frequently until 25.vi.40 (H.G.S.), but not recently; Clasford Common, flourishing colonies 1944/7 (R.W.P.).

*Procris statites* Linn. Sheerwater, two 31.v.34 (H.G.S.); Woking, tolerably common in damp fields, 1912 (H.G.C.); Longcross, one in 1949, four in 1953 (C.W.P.); Chobham Common, a specimen at mercury vapour light (!) vii.52 (E.H.W.); Pirbright, once in a garden; Ash Vale.

## SESIIDAE.

- Aegeria formicaeformis* Esp. Wyke, larvae and pupae in old willows, ii.46 (R.W.P.).
- A. culiciformis* Linn. Ottershaw Queenwood (R.F.B.); Brox Copse (R.F.B.); Normandy (R.W.P.). Larvae and pupae in birch stumps two and three years after felling, common where they occur, but local.
- A. myopaeformis* Borkh. Ottershaw, a few larvae and pupae in bark of an old apple tree, 1947/49, and a moth observed ovipositing in the same tree. No other trees in the orchard are chosen (R.F.B.). Woking, one moth in a window, 1935 (R.W.P.).
- A. vespiformis* Linn. Sheerwater, larvae and pupae in old oak stumps, 1948/9 (R.F.B.). Not found elsewhere, despite search.
- A. tipuliformis* Clerck. Ottershaw, larval workings common in garden currant; Sheerwater, fairly common (H.G.S.). Butts Wood, many traces in a wild currant bush (R.F.B.).
- A. flaviventris* Staud. Horsell Common; Lyne; Chobham Common; Normandy; Frimley; Ash Vale. Larvae locally common in even years in shoots of *Salix cinerea* Linn., usually in bushes growing in wet but sunny situations, but many are stung or dry up.
- A. sphecoformis* Schiff. Ottershaw Queenwood, Chobham Sow Moor and Common, Sheerwater (R.F.B.). Larvae and pupae numerous in alders, usually at the base of stunted bushes. Moths bred 23.v/16.vi.
- Sphecia bembeciformis* Hübn. (*crabroniformis* Lew.). Byfleet, by canal towards Weybridge, vii.02 (*S.L.E.S.*, 1902: 56); Brox Copse, pupae most years, moths bred 2/10.vii (R.F.B.); Virginia Water, Chobham Common, larval traces in *Salix caprea* Linn. (R.F.B.).

## COSSIDAE.

- Zeuzera pyrina* Linn. All traps, scarce to fairly common: only one female. Gracious Pond, at light 9.vii.55 (R.F.); Chobham, female at rest, 19.v.50, and larvae in pear trees in a nursery; Lucas Green, three at light 11.vii.55 (R.F.B.).
- Cossus cossus* Linn. Pirbright and Horsell traps, singly; New Haw and Oatlands, very scarce. Chertsey Mead, female on a post 17.v.50; Sheerwater, larva 1941; Woking, larva in a birch stump 10.iii.50; Lucas Green, at light 11.vii.55; Ash Vale, larval workings numerous, mainly in birch.

## HEPIALIDAE.

- Hepialus humuli* Linn. All traps fairly common to scarce. Locally common in damp meadows and grassy roadsides.
- H. sylvina* Linn. Oatlands trap, once; other traps, scarce. Egham, a few; Ottershaw; Butts Wood; Ash Vale, rather common at light. Frequents dry places on the edges of the heaths.
- H. lupulina* Linn. All traps, common, as everywhere. Very variable; males occur with the forewings almost entirely white, while some of the females are almost black.

*H. hecta* Linn. Ottershaw and Oatlands traps, very scarce. Egham, once; Weybridge, formerly not uncommon; Chobham Common and Sow Moor, many; Lucas Green.

## PYRALES.

### PYRALIDAE.

*Achroia grisella* Fabr. Ottershaw trap very scarce, but a pest in beehives in the garden. Oatlands, not uncommon.

*A. sociella* Linn. Ottershaw trap, scarce. Oatlands, not uncommon; Butts Wood.

*Galleria mellonella* Linn. Oatlands trap, two 12 and 26.vii.55; Woking, a few at light 1910 (H.G.C.: *E.M.M.*, 47: 41).

*Crambus pinellus* Linn. Ottershaw trap, fairly common; Oatlands, common; Sheerwater; Chobham Common, widespread; Lucas Green; Camberley; Ash Vale. Usually on the edges of woods.

*C. perlellus* Scop. Ottershaw trap, fairly common; Oatlands, scarce; Lucas Green. H.G.C. (*E.M.M.*, 48: 45) in 1912 recorded only the f. *warringtonellus* Staint.; but to-day the type is equally numerous. Mainly on the heaths, rather local.

*C. pratellus* Linn. Ottershaw and Oatlands traps, common, as generally.

*C. hortuellus* Hübn. Ottershaw trap, abundant, as generally. A few appear in August, probably of a partial second brood.

(*C. dumetellus* Hübn.). Woking heaths, 21.vi.11 (H.G.C.: *E.M.M.*, 48: 45). Probably local and scarce.

*C. uliginosellus* Zell. Ottershaw trap, 22.vi.46, 25.vi.50; Byfleet, common in a heathery bog, 24.vii.20; Sheerwater, in wet *Molinietum* 25.vii.40, 21.vi.41 (H.G.S.), in reed bed 27.vi.49 (R.F.B.), seen in 1927 and 1945 (S.W.); Horsell bog, 11.vii.54 (R.F.B.); Woking, on heaths, 1910, and in swarms 21.vi.11 (H.G.C.: *E.M.M.*, 47: 41, 48: 45). Probably overlooked, but local and not often common.

*C. pascuellus* Linn. Ottershaw trap, fairly common. Widespread and locally abundant, especially in wet places on the heaths.

*C. hamellus* Thb. Ottershaw trap, scarce. Widespread and common on the heaths.

*C. contaminellus* Hübn. Ottershaw trap, 30.vii.46, three 28.vii/8.viii.54, 29.vii.55; Ash Vale, 28.vii.51 (R.F.). Certainly not common.

*C. geniculeus* Haw. Ottershaw trap, very common, as generally.

*C. falsellus* Schiff. Ottershaw trap, two 13.vii.46, one 24.viii.55; Sheerwater, 1955 (S.W.); Horsell, one in a garden vii.08 (H.G.C.: *E.M.M.*, 47: 41); Lucas Green, one at light 11.vii.55. Certainly scarce.

*C. latistrius* Haw. Ottershaw trap, scarce. Widespread on the heaths, though not very common. Its occurrence so far inland is noteworthy.

*C. iniquinatellus* Schiff. Ottershaw trap, very common, as generally.

*C. tristellus* Schiff. Ottershaw trap, abundant, as everywhere.

*C. culmellus* Linn. Ottershaw trap, very common, as everywhere.

*Schoenobius forficellus* Thb. Ottershaw trap, very scarce; Oatlands, fairly common; Sheerwater; New Haw, common; Butts Wood, once. Mainly in reed beds.

- S. mucronellus* Schiff. Oatlands trap, 10.viii.53, 14.vii.55. Chobham Sow Moor, one 12.vii.49 (R.F.B.). Certainly much scarcer than the last species.
- Acentropus niveus* Oliv. Ottershaw trap, very scarce; Oatlands, sometimes in swarms. Sheerwater, winged females noted 22.vii.55 (S.W.); Lucas Green, both sexes abundant at light 22 and 27.viii.55. Probably present in most ponds and ditches.
- Ephestia elutella* Hübn. Ottershaw trap, very scarce; Oatlands, 28.v, 16 and 28.vi.53, 9.v.54.
- Homoeosoma sinuella* Fabr. Ottershaw trap, fairly common; the larvae feed in the crowns of *Plantago lanceolata* Linn. in the lawn and are dug out in numbers by woodpeckers (*Picus viridis virescens*). Oatlands, scarce; Sheerwater; Woking; Chobham.
- H. binaevella* Hübn. Ottershaw trap, scarce; Oatlands, three 16/27.vii.55. Woking, 1911/14 (R.J.C.: specimens in O.U.M.); Camberley, 30.vii.50 (R.F.).
- Pempelia dilutella* Hübn. Once only: Ottershaw trap, 26.vi.50. Probably a stray from the chalk, as the foodplant, *Thymus*, hardly occurs.
- Alispe angustella* Hübn. Once only: Oatlands, no date. The foodplant, *Euonymus europaeus* Linn., hardly occurs wild.
- Salebria betulae* Goeze. Ottershaw trap, scarce. Horsell, among birch end vi.1911 (H.G.C.: *E.M.M.*, 48: 45); Chobham Common, several bred from birch 1947/9 (R.F.B.).
- Laodamia fusca* Haw. Ottershaw trap, fairly common; Oatlands, scarce. Sheerwater; Chobham Common; Lucas Green; Camberley. Common on the heaths from June until late August, but probably single-brooded.
- Nephopterix formosa* Haw. Ottershaw trap, scarce; Oatlands. Woking, one beaten from a mixed hedge, 1912 (H.G.C., *E.M.M.*, 49: 35).
- N. palumbella* Fabr. Ottershaw trap, fairly common. Abundant on the heaths. Melanic forms occur which, when worn, much resemble *L. fusca*.
- N. similella* G. & Z. Ottershaw trap, scarce; Oatlands. Sheerwater; Gracious Pond; Lucas Green. Only seen at light, but apparently widespread, though it was not known to exist in Surrey until it was taken at Ottershaw 25.vi.50 (*Ent.*, 84: 91).
- N. hostilis* Steph. Oatlands trap, one 16.viii.55.
- Phycita spissicella* Fabr. Ottershaw trap, very common, as generally.
- Dioryctria splendidella* H.-S. Ottershaw trap, male 2.viii.54 (*Ent.*, 88: 19), worn male 23.vii.55. Sheerwater, a pair at light 22.vii.55 (S.W.); Lucas Green, male at light 11.vii.55 (J.L.M.). Probably immigrant only: several others were recorded from unexpected places in Southern England in vii.55. H.G.C. records it "in numbers at Woking, by jarring pine boughs" in 1911 (*E.M.M.*, 48: 35); but all his specimens in O.U.M. are placed under the next species, and there was probably an initial error of identification.

- D. abietella* Schiff. Ottershaw and Oatlands traps, scarce; Sheerwater; Butts Wood, common; Camberley. Probably general among *Pinus sylvestris* Linn.
- Acrobasis tumidella* Zinck. Ottershaw trap, scarce; Oatlands; Sheerwater, at sugar; Butts Wood, bred from larvae and common at light.
- A. consociella* Hübn. Ottershaw trap, scarce; Oatlands; Butts Wood, at sugar 8.viii.46, and light; Lucas Green, one at light 11.vii.55.
- Eurhodope advenella* Zinck. Ottershaw trap, fairly common; Oatlands; Horsell; Woking; Lucas Green.
- E. suavella* Zinck. Ottershaw and Oatlands traps, common; Horsell Common, on ragwort; Butts Wood, many.
- Euzophora pinguis* Haw. Ottershaw and Oatlands traps, scarce; Sheerwater, 22.vii.55 (S.W.). Feeds in the trunks of ash trees, which are not abundant in the District.
- Myelois cribrella* Hübn. Ottershaw trap, fairly common; Oatlands, not uncommon. Not noticed elsewhere.
- M. neophanes* Durrant. Sheerwater, bred from *Daldinia* fungus on birch, 1940 (S.W.); Ottershaw Church Common, six at dusk among burnt gorse 19.vi.54 and traces of larvae later (R.F.B.); Lucas Green, one at light 14.vi.55 (J.L.M.); Ash Vale, larvae (S.W.). But certainly local, as several other searches for moths or larvae have been fruitless.
- Hypochalcia ahenella* Schiff. Ottershaw trap, 19.vi.53; Oatlands, 11.vi.52. Probably strays from the North Downs.
- Cateremna terebrella* G. & Z. Once only: Camberley, one in light trap 30.vi.32 (E. E. Green: *Ent.*, 65: 262). There is little large spruce in the District and so far no cones infested by larvae have been found.
- Endotricha flammealis* Schiff. Ottershaw trap, very common. Abounds on all the heaths. Small specimens, presumably of a partial second brood, at Ottershaw, 6.x.47, 1.x.54.
- Aglossa caprealis* Hübn. Once only: Oatlands, 18.vii.1937 (J.L.M.).
- A. pinguinalis* Linn. Ottershaw trap, 1.viii.47, 12.vii.49; 1 and 6.viii.51; Oatlands, 19.vii.50. Not noticed otherwise.
- Herculia glaucinalis* Linn. Ottershaw trap, fairly common; Oatlands; Sheerwater; Chobham Common; Chertsey, common at sugar viii.1865 and 1867 (A.H.C.: *E.M.M.*, 4: 191, *Ent. Ann.*, 1866: 152). A partial second brood of small specimens regularly in October.
- Hypsopygia costalis* Fabr. Ottershaw trap, very common, as generally. A partial second generation of small specimens in October, in numbers about 10% of the first generation.
- Pyralis farinalis* Linn. Ottershaw trap, 15.vii.55; Oatlands trap, annually, but very scarce. Rare otherwise.
- Synaphe angustalis* Schiff. Ottershaw trap, scarce; Oatlands, once; Chobham Common, 19.vii.47.
- Scoparia dubitalis* Hübn. Common generally.
- S. basistrigalis* Knaggs. Oatlands, 10.vii.48 (J.L.M.).
- S. ambiguus* Treits. Common generally.

- S. cembrae* Haw. Ottershaw trap, 24.vii.49, 9.vii.50 and a few since; Oatlands 25.vii.54. Certainly scarce.
- S. centurionalis* Hübn. (*crataegella* Hübn. nec Linn.). Ottershaw; Byfleet (S.W.). Fairly common generally.
- S. angustea* Steph. Ottershaw trap, fairly common; Oatlands. Fairly common elsewhere.
- S. truncicolella* Staint. Ottershaw trap, common; Sheerwater (S.W.); Horsell Common, locally abundant among *Pinus sylvestris* Linn. (R.F.B.).
- S. mercurea* Haw. (*frequentella* Staint.). Common generally.
- Nymphula stratiotata* Linn. Ottershaw trap, scarce; Oatlands, common; Sheerwater, common; Lucas Green.
- N. stagnata* Don. Ottershaw trap, scarce. Abundant by ponds and streams.
- N. nymphaeata* Linn. Ottershaw trap, scarce. Generally abundant by water from June to September.
- Cataclysta lemnata* Linn. Ottershaw trap, very scarce; Oatlands; Byfleet, abundant. More local and usually less common than the other Water Pyrales.
- Palpita unionalis* Hübn. A scarce migrant, not recorded from the District before 1955 (though it reached Surbiton in 1937). 1955: Ottershaw trap, male 19.viii; Oatlands trap, male, which escaped, 20.viii; New Haw trap, two 24.viii and five in previous few days; Horsell trap, male 11.ix. These were part of an unprecedented immigration, some members of which spread as far as North Wales and Inverness-shire. There are indications that native-born offspring occurred in November in south Surrey and north-west Hants, but there is no evidence that this happened in our District.
- Mesographe forficalis* Linn. Ottershaw trap, very common, as generally. In two generations.
- Evergestis pallidata* Hufn. (*straminalis* Hübn.). Ottershaw trap, very scarce; Rowtown, in a wet field (R.F.B.); Sheerwater, local (H.G.S., S.W.); Oatlands, fairly common.
- Sylepta ruralis* Scop. Ottershaw trap, very common, as everywhere near *Urtica dioica* Linn.
- Nomophila noctuella* Schiff. Immigrant, breeding in the District but not surviving the winter. Abundant in 1946, 1952, 1954; common in 1955; very scarce in 1950, 1951 and 1953.
- Loxostege palealis* Schiff. Three records only: Ottershaw trap, female 26.viii.52; Oatlands trap, 5.viii.51, 21.vii.52. Probably not resident in the District.
- L. verticalis* Linn. Ottershaw trap, fairly common; Oatlands; Lucas Green. A partial second brood in August.
- Perinephela lancealis* Schiff. Ottershaw trap, scarce; Oatlands, two only; Butts Wood, a few regularly; Chobham Sow Moor. In damp woods. Its usual food, *Eupatorium cannabinum* L., is very local here.
- Eurrhynx hortulata* Linn. (*urticata* Linn.). Ottershaw trap, common, as generally among *Urtica*.



- Pyrausta nivealis* Fabr. (*prunalis* Schiff.). Ottershaw trap, fairly common; Oatlands, scarce. Common in hedges and woods.
- P. lutealis* Hübn. Ottershaw and Oatlands traps, very scarce. Sheerwater, 13.vii.47. Not common.
- P. martialis* Guen. (*ferrugalis* Hübn.). A fairly regular immigrant. A few are seen in June as well as larger numbers in the autumn. It probably breeds in the District, but is seldom common. Not recorded at all in 1948, 1951, 1953.
- P. olivalis* Schiff. Ottershaw and Oatlands traps, scarce. General in hedges, but only fairly common.
- (*P. stachydalis* Zinck.) Not uncommon early in July, in one very restricted locality near Woking: netted along a ditch full of *Stachys palustris* Linn. Larvae in August and September (H.G.C.: *E.M.M.*, 48: 45). Horsell, vi.13 (R.J.C.: specimens in Oxford University Museum). Not seen since, despite search; but it could be easily overlooked among the next species.
- P. coronata* Hufn. (*sambucalis* Schiff.). Ottershaw trap, fairly common, as generally in hedges and woods.
- P. nubilalis* Hübn. A recent settler in the District. First seen at Oatlands in 1952, then in growing numbers in each subsequent year, now common. Ottershaw trap, one 1952, one 1953, thirty-five in 1955. Sheerwater, two 15.vii.55; Lucas Green, 11.vii.55. The usual food, *Artemisia vulgaris* Linn., is rather local.
- P. verbascalis* Schiff. Ottershaw trap, scarce; Oatlands trap, one 1952 and one in 1954; Butts Wood, several at light.
- P. purpuralis* Linn. Ottershaw trap, scarce, and only occasionally elsewhere.
- P. aurata* Scop. Ottershaw and Oatlands traps, scarce. Noted elsewhere by damp ditches, but not common.
- P. cespitalis* Schiff. One record only: Ottershaw trap, 2.vii.46. Possibly overlooked, though it is mainly a chalk insect.
- P. crocealis* Hübn. Oatlands, 16.viii.54; Byfleet, 19.vii.1902 (*S.L.E.S.*, 1902: 56); Sheerwater, 13.vii.46 (R.F.B.).

#### PTEROPHORIDAE.

- Trichoptilus paludum* Zell. Chobham Common, locally common in early August, but much less widespread than its foodplant, *Drosera*.
- Oxyptilus britanniodactylus* Gregs. (*teucris* Knaggs). Ottershaw trap, 28.vii.51; Byfleet, 26.vii.14 (R.J.C.: specimen in O.U.M.). Probably overlooked.
- Platyptilia cosmodactyla* Hübn. Ottershaw trap, 29.viii.49; Oatlands, 1.vii.47, sitting in herbage by the Broad Water (J.L.M.).
- P. acanthodactyla* Hübner. One record only: Ottershaw trap, 18.viii.46.
- P. gonodactyla* Schiff. Ottershaw trap, very scarce; Oatlands, scarce. Noted occasionally elsewhere among *Tussilago*, but scarce. Two broods.



- P. ochrodactyla* Schiff. Ottershaw trap, once; New Haw Bridge, many 29.vii.49, 20.vii.50; Brox Pit, abundant 2.viii.54, 31.vii.55; Oatlands, one in a lane 4.viii.48. Probably occurs wherever *Tanacetum* is established.
- P. pallidactyla* Haw. Ottershaw trap, common; Ottershaw Church Common, 20.vi.54; Oatlands; Gracious Pond, 15.vii.55 (R.F.). Emerges nearly a month earlier than the last species and is widespread among *Millefolium*.
- Stenoptilia bipunctidactyla* Scop. Oatlands, 3 and 29.vii.54, 17.viii.55; Byfleet, 19.vii.1902 (*S.L.E.S.*, 1902: 56). Apparently local and not common, though it may be overlooked.
- S. pterodactyla* Linn. Ottershaw trap, scarce; Byfleet; Lucas Green.
- Marasmarcha lunaedactyla* Haw. Ottershaw trap, 29.vi and 1.vii.49. The foodplant, *Ononis*, is scarce.
- Alucita pentadactyla* Linn. Ottershaw trap, scarce, but very common in the garden at dusk; Oatlands; Byfleet. General on waste ground among *Convolvus sepium* Linn.
- Leioptilus lienigianus* Zell. Horsell, disturbed by day from *Artemisia vulgaris* Linn., 1912 (H.G.C.: *E.M.M.*, 49: 35), and many bred vi.1913 (R.J.C.: in O.U.M.); Oatlands, 22.vi.33, 19.viii.38, 8.viii.47.
- Oidematophorus lithodactylus* Treits. Ottershaw trap, 27.vii.49. Also noted elsewhere.
- Pterophorus monodactylus* Linn. Ottershaw and Oatlands traps, fairly common, as generally in autumn and in spring after hibernation. The July emergence is seldom seen.

## ORNEODIDAE.

- Orneodes hexadactyla* Linn. Ottershaw trap, fairly common in the autumn and after hibernation in May; Byfleet, 1.vi.1901; Chertsey, very abundant 1863 (A.H.C.: *Week. Ent.*, 2: 212).

## CENSUS OF SPECIES.

Group.	Recorded in present list for N.W. Surrey. (1)	Of which probably now resident. (2)	Probably now resident in British Isles. (3)	% Col. 2 of Col 3. (4)
PAPILIONES	44	38	57	66·7
SPHINGES	14	10	10	100·0
BOMBYCES	71	68	92	73·9
AGROTIDES	225	205	310	66·1
GEOMETRIDES	204	190	283	67·1
PSYCHES, ETC.	19	19	33	57·6
TOTAL MACROS	577	530	785	68·8
PYRALIDINA	99	91	188	48·4

NOTE:—To arrive at Col. 2, there have been excluded from Col. 1 all those species which are believed to be irregular immigrants from the Continent, mere strays from the country surrounding the District, or now extinct within it. Col. 3 includes all species which have been recorded as occurring within the British Isles as a whole *less* those which are believed to be irregular immigrants from the Continent, or accidentally introduced, or now extinct, or of doubtful authenticity. Species which, though immigrant, appear in large numbers every year have been retained as "resident". These distinctions are necessarily to some extent a matter of judgment.

**FREQUENCY DISTRIBUTION OF SPECIES OF MACRO-  
LEPIDOPTERA RECORDED IN LIGHT TRAPS AT  
OTTERSHAW 1946/55 AND HORSELL 1952/55.**

(The percentages of total species and total moths are in brackets.)

	OTTERSHAW.		HORSELL.		Number of Species in the same class in both traps.
	Number of Species.	Number of Moths.	Number of Species.	Number of Moths.	
Dominant	4 (0.9)	37,774 (28.6)	6 (1.5)	22,877 (35.6)	3
Abundant	18 (4.2)	39,495 (29.9)	13 (3.1)	12,846 (19.9)	10
Very Common	39 (9.1)	27,638 (20.9)	47 (11.4)	15,999 (24.9)	23
Common	78 (18.2)	18,212 (13.8)	82 (19.8)	9,048 (14.1)	45
Fairly Common	83 (19.4)	6,475 (4.9)	61 (14.8)	2,291 (3.6)	29
Scarce	77 (18.0)	1,885 (1.4)	73 (17.7)	927 (1.4)	31
Very Scarce	129 (30.2)	631 (0.5)	131 (31.7)	315 (0.5)	77
TOTAL	428 (100.0)	132,110	413 (100.0)	64,303	218

NOTE:—51 species were recorded from one trap only, 48 of them falling there into the "Very Scarce" class, 2 into "Scarce", and 1 into "Fairly Common". Of the 395 species which occurred at both traps, 218 (55.2%) fell into the same frequency class at each trap, 150 into adjacent classes, and for 27 there was a difference of two classes. This, however, exaggerates the extent of the differences between individual species, since some may fall in the bottom of one class at one trap and in the top of the next at the other. Examination of the figures shows that for only 68 species did the difference exceed a full frequency range (*i.e.* was the species more than about three times commoner at one trap than the other); and for only 12 of these did it exceed two ranges (*i.e.* was the species more than ten times commoner). Moreover, 42 of these were species of which the numbers recorded at either trap are very small, so that the ratios between them have little statistical significance.

## LARVAE OF THE BRITISH LEPIDOPTERA NOT FIGURED BY BUCKLER.

Compiled and illustrated by G. HAGGETT.

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It is over fifty years since the Ray Society completed publication of Buckler's drawings in his "*Larvae of British Butterflies and Moths*"; the work may really be said to have ceased at the time of Buckler's death in 1884 for whereas there are a few descriptions added after that date there are no further illustrations given. The indefatigable Buckler had succeeded in portraying the majority of British macro species known in his day and had even been able to secure continental larvae of the rarer British residents and migrants.

In the intervening years many new species of macros have been added to the British Fauna; a number are quite newly established, others were formerly not distinguished from closely allied forms, a very few had been totally overlooked, and some of the less frequent migrants are now known to breed here at least on occasions and their larvae may be encountered wild; there are in addition those species that were rarer, or lesser known, in the last century, of which Buckler was unable to procure larvae.

At the present time there are still few illustrations of these larvae, for no comprehensive handbook on the British species has appeared since the days of Barrett, Tutt & South. Frohawk completed our knowledge of the early stages of British butterflies but no comparable work on moths has been attempted. Yet great work has been done in the elucidation of life histories and a good many descriptions of the early stages have been made in the journals, most notably by Dr. Cockayne, H. M. Edelsten & C. N. Hawkins.

The Society has now undertaken the considerable and costly task of publishing an account of these little known larvae, an undertaking in which it is hoped to collate the careful but scattered work of half a century together with original drawings. The work is primarily designed to aid recognition of larvae in the field, but if at the same time it can make its contribution to the study of generic and species problems then much more will have been accomplished.

There are some 80 species which need to be dealt with of which nearly half have been secured. New figures are required of those species outstanding, many of them from Scotland and the northern counties, and it is earnestly hoped that entomologists will be generous enough to send or loan eggs or larvae for this purpose; a list of species still required is given separately.

I am most anxious to thank colleagues who have already contributed specimens and, in particular, I wish to express my indebtedness to H. E. Hammond and A. J. Wightman. Free use has been made of earlier

work, including verbatim quotes of larval descriptions and habits; full acknowledgment will be given with each species but I should like at this juncture to thank the Editors and publishers of the 'Entomologist', 'Entomologist's Record', 'Entomologist's Gazette' and 'Entomologist's Monthly Magazine' for permission to reproduce work that has appeared in those journals.

Larvae required for illustration and description:—*Colias calida* Vty. (*australis* Vty.), *Euplagia quadripunctaria* Pod., *Rhyacia simulans* Hufn., *Procyus versicolor* Borkh., *Luperina dumerilii* Dup., *L. nickerlii* Frey., *Apamea exulis* Lef., *A. assimilis* Dbdy., *A. sublustris* Esp., *A. pabulatricula* Brahm., *Hydraecia crinanensis* Burr., *H. lucens* Frey., *H. oculate* L., *Nonagria neurica* Hb. (*edelsteni* Tutt), *Arenostola brevilinea* Fenn., *A. extrema* Hb. (*concolor* Guen.), *A. morrisii* Dale (*bondii* Knaggs), *Leucania unipuncta* Haw., *L. vitellina* Hb., *L. albipuncta* Schiff., *Laphygma exigua* Hb., *Heliothis armigera* Hb., *H. maritima* Gras., *Jaspidia deceptoris* Scop., *Schranksia taenialis* Hb., *Tholomiges turfosalis* Wocke, *Sterrhia humiliata* Hufn., *Dysstroma concinnata* Steph., *Lampropteryx otregiata* Metcalfe, *Ortholitha umbrifera* Prout, *O. scotica* Cockayne, *Rheumaptera* (= *Eulype*) *subhastata* Nolck., *Perizoma minorata* Treits., *P. taeniata* Steph., *Isturgia carbonaria* Clerck, *Psolos* (= *Psodos*) *coracina* Esp., *Zygaena meliloti* Esp., *Z. achilleae* Esp.

The following may occur in imported fruit or plants:—*Pyrrharcetia isabella* Abbot & Smith, *Brithys crini* Fab., *Prodenia litura* Fab.

*Arenostola fluxa* Hb. (*hellmanni* Ev.) Mere Wainscot.

The principal haunts of this species have long been known to be the fen relics of Cambs. & Hunts. and in particular at Wicken and Woodwalton. Colonies are also known from the drier marginal fenlands of Suffolk and Northants., and there are records from Yarmouth and Lowestoft. Two moths were recorded from N. Devon in 1947, while from S. Devon, Seaton has for some years been known as another locality. Also known from Hants.

The following account of the life history is given by Edelsten & Todd (1912 *Entom.*, 45, 286).

"The eggs are laid in batches within the sheathing-leaf of the flower-stem of *Calamagrostis canescens* (Weber) Roth. (*lanceolata* Roth.) and *C. epigejos* (L.) Roth., and the larva enters the stem and feeds downwards, and hibernates towards the base of the stem. In the spring it feeds in several plants before it is full-fed. It leaves the plant when about to pupate, and spins a strong earthen cocoon.

*Description of fullgrown larva.* "June 15th, 1910—length about 20 mm. tapering from middle to head, rather less towards tail. Colour creamy white; head brown. Prothoracic plate ochreous; anal plate ochreous, except the front part of it which is blackish and it extends to thirteenth segment. True legs yellowish; prolegs creamy with black hooks; spiracles black. A few bristles from tubercles. A good many bristles on anal plate.

"The larvae of *concolor* and *hellmanni* are so very much alike that it is difficult to tell them unless one has them side by side. They feed in identically the same way, and their habits are similar. They cause the leaves to turn yellowish and wither, but are hard to find, as there are all the old leaves about in the spring. The only way to find the larva is to seek for isolated plants, part the herbage right down to the root and see if there is any frass or a yellowish leaf. The larvae are more often than not just below the surface of the ground, as *Calamagrostis* is a deep rooting plant."

When collecting larvae of *A. fluxa* at Mildenhall on 27th May 1951 I made these comments—"there is no easy way of finding these, it is simply a matter of sitting amidst dense patches of *Calamagrostis* stems, first raking up the debris to leave the stems bare and then pulling sharply each sizeable stem or closely grown group of stems. The greenish-yellow, dorsally pinkish larva will be found at ground level upwards for two inches inside the lower stalk. Some larvae are redder than others".

The present composition of the genus *Arenostola* is unfortunate in so far as the larval types are concerned; both *A. brevilinea* Fenn and *A. phragmitidis* Hb. (type) are very different from the others in having a large globular head, well pigmented and ornamented cuticle and cylindrical body, whereas the rest of the genus have a very uniform spindle-shaped larva, with a weakly coloured skin and small pointed head. Their habits are also most unlike, the larvae of *A. brevilinea* and *A. phragmitidis* feeding in the upper shoots of *Phragmites*, those of the others in the lower fleshy stem of *Carex*, *Calamagrostis* and *Festuca*. With the important exception, therefore, of *A. brevilinea* and *A. phragmitidis*, the larvae of *Arenostola* show affinities with *Oria*, *Sedina* and *Procus* rather than with *Nonagria* and *Hydraecia* (micacea form).

Figures—Plate VI, fig. 1; a and b, last instar. In lower stems of *Calamagrostis*. Mildenhall, 27.v.51.

*Sedina buettneri* Hering. Blair's Wainscot.

The first notice of *S. buettneri* as a British insect was made in 1946 when W. H. T. Tams (*Entom.*, 79: 218) discussed Dr. Blair's remarkable Isle of Wight captures taken the previous year and referred to Urbahn's original work (*Stett. Ent. Zeit.*, 94: 136-153 and 322-325); a poor figure of the larva is given from Urbahn's work.

In the years following Dr. Blair's original captures the moth was taken in some numbers by parties of collectors working each autumn at Freshwater in the small area of the local marsh. This remains the only known British locality but in 1950 it was devastated by cutting and burning.

Opinions on the origin of this moth at Freshwater are diverse. It is widely held that it could not have been overlooked for so long, or have been restricted to this one locality had its origin been any other than due to migration. The opposite view is that the species is not migratory and that owing to the obscure habit of moth and larva, it

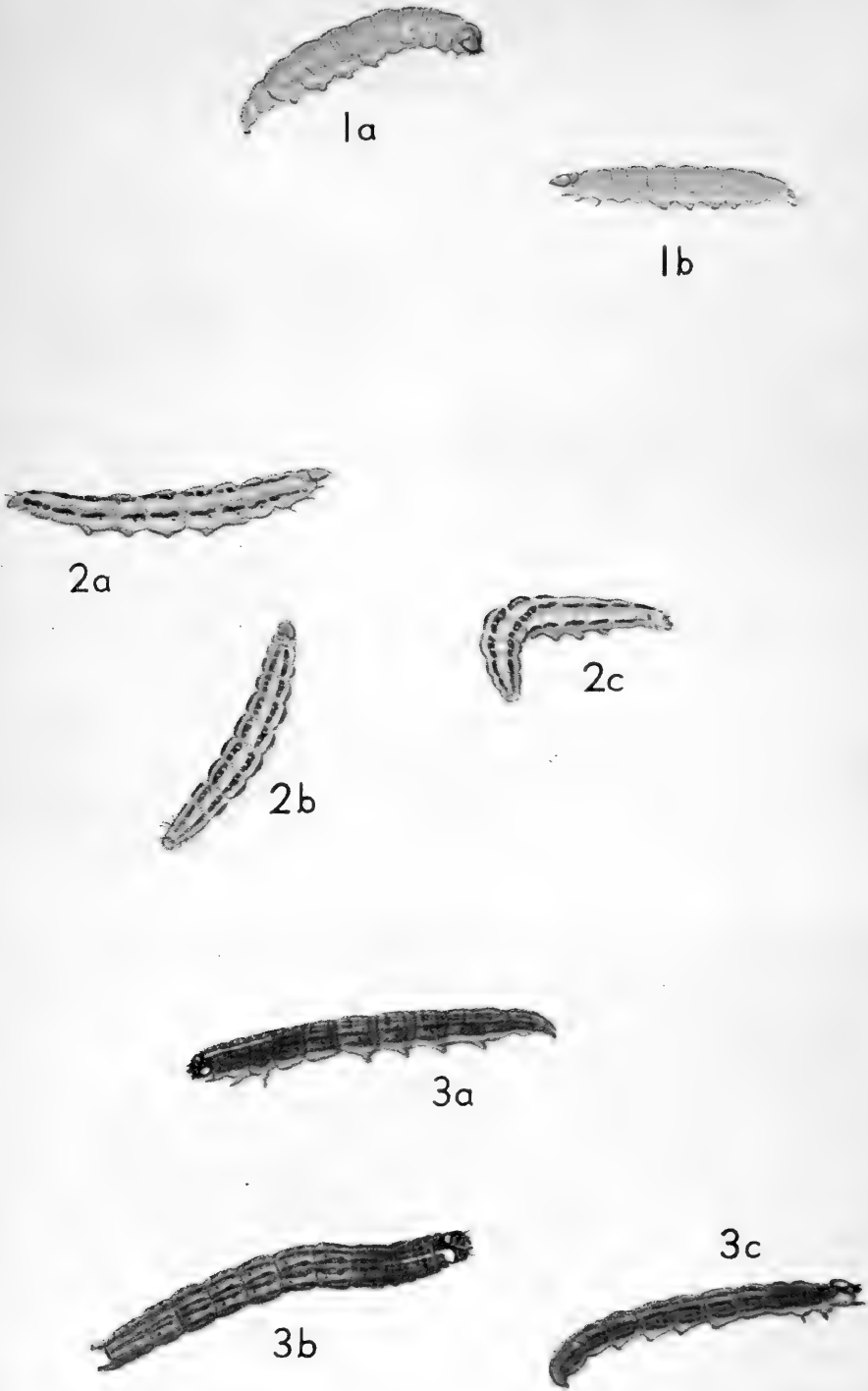


Fig. 1. *Arenostola fluxa* Hb.

Fig. 2. *Sedina buettneri* Hering.

Fig. 3. *Chilodes maritima* Tausch.



could well escape detection until Blair came to live on its doorstep: to dismiss newly discovered colony insects such as *S. buettneri*, *Calamia virens* L. and *Hydraecia hucherardi* Mab. as recent introductions is certainly to overtax the most credulous.

Accounts of this species and its habits are given in various journals from 1946 to 1951. In 1950 Dr. Blair described (*Ent. mon. Mag.*, **86**: 47) the egg and early larval instars, and he later (1951, *Ent. mon. Mag.*, **87**: 131) compared the larva with *Rhizedra lutosa* Hb. and other internal feeding species; in 1951 he also gave a useful summary (*Ent. Gaz.*, **2**: 249). H. Robinson (1950, *Ent. Gaz.*, **1**: 150) described finding the wild larva at Freshwater.

In Britain the moth flies in the latter part of September and during the first fortnight of October; although it comes readily to light its flight at dusk can be wild and erratic. Dr. C. G. M. de Worms says there is a dusk flight about 7 p.m. G.M.T. and another from 8-9 p.m. "when males can be obtained fluttering up among the dense reeds and *Carex*". On several occasions the female has been found laying eggs on *Carex acutiformis* Ehrh. towards the tip of the blade, the eggs being laid in rows from about 6-20 in the reflexed underside. In captivity eggs have hatched as late as the first week of May, others by mid March. The species has not yet been successfully bred to the pupal stage in this country; young larvae have grown slowly to reach full growth on the fleshy shoots of *Carex* and *Glyceria* (*Poa*) *maxima* (Hartm.) Holmb. (*aquatica* L.) in July. They feed in a good many stems and move freely from one to another.

Blair's description of the larva in its second instar is as follows—"Length  $3\frac{1}{2}$  mm. Head, prothoracic and anal plates and legs pale brown, body white, nearly cylindrical, segmental divisions rather sharply marked, the four dark lines stronger and more complete, not, or very narrowly, broken at the segments, the two dorsal nearer together than to the lateral lines, separated by about their own width, terminating in front at the prothoracic plate, and confluent behind, the lateral lines continued forward below the plate. Colour of these lines purplish or maroon, their edges finely irregularly indented and not sharp and clear cut. They are crossed by a few complete or partial but irregular thin lines of the ground colour. The four usual setae are present on the dorsum of each segment, the anterior pair at  $\frac{1}{3}$  near the middle of the stripe, the posterior pair near its outer edge: further a strong seta at about anterior  $\frac{1}{2}$  on dorsal edge of lateral stripe; the spiracles along its lower edge; another seta at about  $\frac{1}{3}$  the width of the stripe below it; the setae very long and strong on anal plate and penultimate segment".

In later instars and at full growth the larva differs only slightly from the second; the last pair of spiracles are so much larger than the others that they occupy the full width of the lateral band of their segment; the two dorsal stripes are quite separate throughout their lengths. The arrangement of warts associated with the stripes on the eighth and ninth segments is unusual—on the eighth there is a pair of jet black warts, each wart situated in the middle of its stripe, and another pair



of rather larger black warts is placed similarly but posteriorly to them; on the narrow ninth segment there is a further pair of large black warts still wider apart than the preceeding pair and placed immediately in front of the anal plate, these being the largest of a series of four small warts to each side of the segment. The maroon stripes become weakly expressed on the eighth segment but terminate more boldly on the anterior part of the ninth.

At full growth Blair's larvae measured 1.6 mm. across the head width which was just half that of the general body; the total length of the larva was to 28 mm. The colour was nearly white with a faint pinkish tinge, the stripes maroon, the head pale honey yellow with brown mouthparts and black ocelli; thoracic and anal plates and legs coloured as the head, without dark edges.

The insect is not, as was formerly supposed, a close relative of *Simyra albovenosa* Goeze, but modern opinion is still divided on its precise relationship with other internal feeding Agrotids. It has been associated with and likened to *Rhizedra* but Blair has clearly shown how very different are the two larval types. Blair thought the larva of *Rhizedra* to be in an intermediate position between *Hydraecia* and *Nonagria* and *Sedina* to be closer to the *fulva* (= *pygmina* Haw.) forms of *Arenostola*, and commented on its similarity to *Procus*. I would agree with this and say the life history of *Sedina* has much more in common with the *Oria-Procus-Arenostola* group than with any other.

*Figures*—Plate VI, fig. 2; a, b and c, all last instar. Bred ex female, Freshwater, I.O.W., in stems of *Glyceria maxima*. R. Parfitt. 24.vii.51.

#### *Oria musculosa* Hb. Brighton Wainscot

The early British history of this moth is admirably summarised by Dr. Cockayne and Dr. Kettlewell (1940, *Ent. Rec.*, 52: 37); the authors discuss the original Brighton records from 1855-1858 but disagree with Barrett's opinion that these were due to offspring from migrants that effected a settlement for that period. The last known Brighton capture was in 1883.

The first Salisbury records date from 1909 and local collectors continued to take occasional examples of the moth until 1938 when Drs. Cockayne and Kettlewell established that the insect was breeding in the local wheat and oat fields and was in fact very numerous there. Since then the species has flourished over a wide area of the Salisbury-Winchester-Devizes chalk hills, with a period of exceptional abundance during the later war years and those immediately following (1944-50) due to accelerated crop rotation. It is remarkable that the species has so completely disappeared from the Brighton district for the Sussex downs are so similar a habitat to the Salisbury hills. Records from outside Wiltshire remain casual, thus Weybridge (Surrey) 1951 and 1953, Isle of Wight and Sway (Hants) 1951, Eton (Bucks) 1938, Bourton on the Water (Glos.) 1953, Weston-super-Mare (Somerset) 1955 and the

curious Somerset record of 1945 (*Entom.*, **78**: 175), S. Devon 1899 and Witley (Surrey) recorded in 1928. The moth is evidently established in the Burghclere district of S. Berks, for Sir Robert Saundby has taken it there in most years since 1948. While it is quite evident that *O. musculosa* is a well established indigenous species, these widely scattered records still argue the case for migration, or at least indicate a wandering tendency if only from the established British colonies: in this connection it is worth noting the record of six *O. musculosa* taken on a ship 1½ miles off Cyprus on the remarkable date of 2nd May 1949 (1951, *Entom.*, **84**: 247).

In England the moth is out from late July to mid August, the peak emergence varying a good deal within those limits depending on the season; it comes freely to light on favourable nights or may be found on cold evenings sitting on the ears of wheat and other cereals. By day it has been turned out in plenty by the reapers.

There has been considerable speculation on the means by which *O. musculosa* survives from year to year, owing to the fact that the normal crop rotation is for hay (and clover) or root crops to follow the grain, and while it is quite likely that eggs may survive ploughing, there is no succession of cereals as foodplant except in abnormal circumstances (war years, or poor, unclean farming). Kettlewell (1945, *Entom.*, **78**: 85) has the most likely solution in suggesting the proper wild habitat to be amongst grasses that surround fields and from which moths invade cereal crops and breed more successfully in them.

The life history is now well known, thanks to an excellent account by H. M. Edelsten (1944, *Entom.*, **77**: 145). Earlier (1940, *Ent. Rec.*, **52**: 37) Drs. Cockayne and Kettlewell had given the history as described by continental authors and in particular from a paper by Prof. S. Mokrzecki (1907, *Z. wiss. Insekt biol.*, pp. 3, 50, 89), from which the following extracts are repeated.

"In nature the eggs are laid on the stalks of grasses growing near wheat, usually under a sheathing leaf. They are laid in lines, 20 in a line, and two lines are laid alongside one another. They are also laid on dead objects in a field such as posts.

"On emergence from the egg the larva finds the nearest grass and later transfers itself to winter wheat, summer rye, oats, or barley. It bores into a stem, making a small round hole near the ground, and feeds internally . . . . When the old stem can no longer contain it, the larva wanders off to another shoot. The old shoot withers above the infected part, but the roots and lower part of the shoot remain undamaged. There is only one larva to each shoot, but frequently every shoot in a given plant is attacked in turn by the same larva . . . . When full grown the larva leaves the stalk and takes up a position beneath the sheathing leaf, which covers the ear of corn, and feeds on the unripe grains and fills the whole sheath with white frass. The whole ear may be eaten.

"About the first week of June the larvae leave the sheath and burrow into the earth to pupate but some can still be found up to June 10th.

"The larva usually pupates under an infected stem and when this is pulled up the pupa may be found exposed in the earth underneath (Kurdjumov)."

*Description of larva.* Edelsten's descriptions of the larva are as follows:—

"*Newly hatched larva, April 2.* Length  $1\frac{1}{2}$  mm. Colour yellowish pink, head black, plate on prothoracic and anal segments brownish black, subdorsal and lateral stripes hardly visible. Prolegs spread outwardly. Head and body with numerous white setae.

"*Final instar, June 18.* Length  $30\frac{1}{2}$  mm. Colour pale green, head ochreous yellow, clypeus brownish. Prothoracic plate greenish ochreous, blackish laterally, a narrow black posterior margin; serrate centrally. Two central sclerotized plates between head and plate. Anal plate semicircular, greenish fuscous, blackish towards margins and where subdorsal lines run through it. Subdorsal lines dark green: on meso-segment rather blackish-green, more like dark spots; lateral lines also dark green. On pro-thoracic segment in front of spiracle is a black triangular pinaculum; three black pinacula arranged in a triangle on the meso-segment, the upper one smaller than the others, while on the meta-segment the arrangement is similar, but the upper pinaculum is smaller than that on the meso-segment. True legs yellow brown, ventral legs pale greenish and spread outwardly, anal pair with a horny exterior lateral plate. Spiracles small and black. Setal tubercles black, with lateral line."

Prof. Mokrzecki describes the full grown larva as having "four longitudinal dark red-brown stripes" but the only form of the mature larva known in Britain is that with green stripes as in Edelsten's account. Although Edelsten states that the subdorsal and lateral lines are indistinct of the newly hatched larva, I found they became well marked before the first moult, as indeed Edelsten (1944, *Entom.*, 77: Pl. V, fig. 3) shows; at this stage the larva bears a remarkable similarity to the same stage of *Hydraecia oculea* L.

*Figures*—Plate VII, fig. 1, ex ova, Tilshead (Wilts) females. Reared on oats. a, first instar 19.iv.54; b, third instar 7.v.54; c and d, last instar 28.v.54.

*Chilodes maritima* Tausch (*ulvae* Hb.). Silky Wainscot.

Although the species is now known to occur much more widely than was formerly supposed, its distribution is still principally the coastal reed beds of East and South-east England, but localities are known from Selby, Yorks, the Severn estuary, Glos., the South Devon coast and West Hants. Apart from the fen and broads districts of East Anglia there are few inland records such as the Byfleet, Surrey, station.

The larva passes the winter within the shelter of old reed stems that have been tunnelled by *Nonagria* larvae or simply in broken stems with a long section above the node; it is unable to enter an unopened stem. Larvae are best collected in late spring when nearing full growth: there

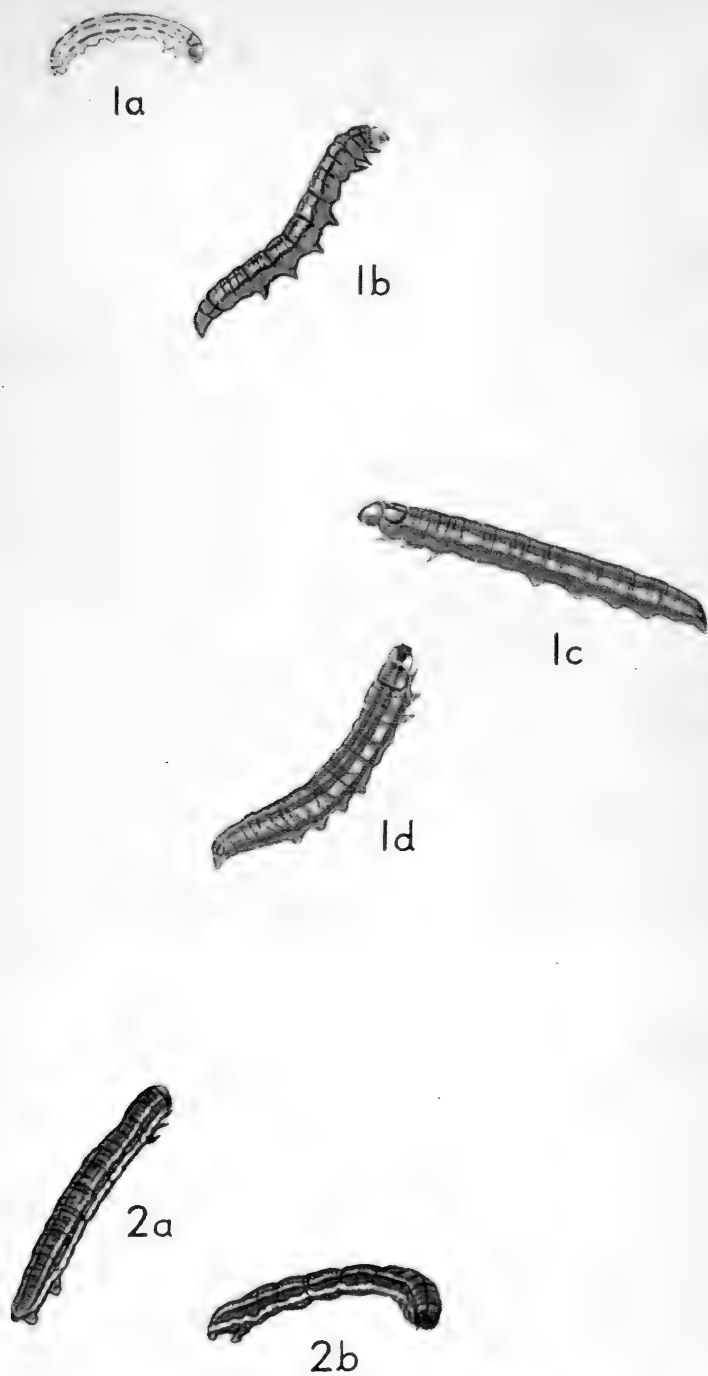


Fig. 1. *Oria musculosa* Hb.

Fig. 2. *Eupithecia arceuthata* Freyer.



is no simple guide to their discovery, perseverance, patience and the examination of each broken reed stem being necessary.

Food consists of all kinds of small life, dead or alive, augmented by the membranous silky lining of old reed stems (Cockayne) and I believe old and parasitized pupae. In captivity even meat fats are eaten.

*Description of the full grown larva.* In shape and form the larva closely follows the slender *Nonagria* build but in colour, pattern and head form it has the appearance of a Caradrinid.

The cylindrical body is slightly flattened along the dorsum with little folding of the abdominal rings but the wrinkled thoracic segments are contractile and much telescoped when the larva is at rest. The general colour is dull ochreous inclined to pinkish and is much freckled with dark brownish grey along the dorsum and lateral bands. The dorsal line is pale, fine and prominent only along the thoracic segments, becoming confused and thickened along the abdomen where it is closely associated with dark irrorations and mottling, the most distinctive of which are the two anterior trapezoidal spots and two similar dots placed posteriorly to them. Lateral bands are composed of grey flecks but are well defined above by a broken dark wavy line. Thoracic segments and the first abdominal are totally suffused with dark greyish brown above the spiracle line. The larva is set with sparse fine hairs; warts tiny and black. Abdominal legs fleshy and equipped with many large crochets, each leg with a prominent large wart and pale shining plate: anal claspers long and slender with five tiny black warts. Thoracic legs slender and grey-ochreous. Spiracles small, oval and black. Head dark mottled with a thick bar to each side, the clypeus marked conspicuously in black at its apex to form a narrow  $\Lambda$ . Antennae large with a stout white basal joint; the mouthparts unusually conspicuous and strong; the head is set with many long hairs and is very flattened. Prothoracic plate soft and ill-defined, crossed by the pale dorsal line.

The larva measures to 28 mm. when fully grown. It moves with the jerky predatory movements common to other Agrotid cannibals. There is no evidence that it attacks its own species. It has the habit when resting of flattening the body all but the head and thoracic segments which are withdrawn and thrust upwards in an aggressive pose.

*Figures*—Plate VI, fig. 3; a, b and c, all last instar. In old reed stems, Arundel 10 and 27.iii.52.

#### *Eupithecia millefoliata* Rössl. Yarrow Pug.

The specimen taken at Ham Street in 1933 by Dr. de Worms is evidently the earliest known British example. Then in 1939 Mr. Austin Richardson took a moth in Kent but this also was not identified as this species until a number of moths were reared from larvae collected at Sandwich in 1947. Since then the larva has been obtained not uncommonly, and sometimes in great abundance, along the Kent coast from Ramsgate to Folkestone and Romney Marsh, and in Sussex from East-

bourne to Selsey Bill with inland stations at Arundel, Pulborough and Lewes, and extending to Portsmouth, Hants.

This considerable area of distribution suggests that the species is a long established resident on the S.E. coastline, yet its habits and times of appearance coincide so closely with those of *E. icterata* Vill. s.sp. *subfulvata* Haw. that one wonders how the collecting of one could be accomplished without the other. But the pugs are a much neglected group and adults of *subfulvata* are easily obtainable almost anywhere in the country. So *millefoliata* could have been a British insect for many years before its discovery, but not I think as far back as the last century when the pugs were more constantly under review, and when such "species" were recognised as *curzoni* Gregs., *stevensata* Webb., *tamarisciata* Frey. and *egenaria* H.S., while at the same time Crewe was thoroughly enquiring into the British *Eupithecias*. I think it extremely unlikely that the many south coast collectors would have overlooked *millefoliata*, if only as a congener of *subfulvata*. Nor can one imagine such an authority on world Geometers as Prout to pass over *millefoliata* in British collections even although he is said to have dismissed Richardson's specimen. It seems most likely that *millefoliata* became established in Britain at some time between the wars in much the same way as did *Leucania l-album* L.

The larva of *E. millefoliata* feeds on the seed heads of Yarrow (*Achillea millefolium* L.) and may be found at various stages of development in October, from tiny pale yellowish immature larvae to the beautifully camouflaged full grown example: it rests by day amongst the withered flowers, usually head upwards, or slightly curled in the Corymb. In captivity larvae will feed slowly until December.

Larvae of *E. subfulvata* occur on Yarrow at the same time of year but are very obviously distinct, being more elongated, more slender and with a well defined series of bisected diamonds along the dorsum: they are less inclined to live in the flower heads.

*Description of larva.* The fully grown larva is rather variable in the depth of brown ground colour and in the tint of the pale dorsal blotches which may be pink or plain buff or fawn. The pattern and characteristic stumpy build and roughened warty skin are very constant.

Length to 15 mm. General colour a shade of sombre brown ranging from deep purple brown to pale chocolate. There is no true dorsal line but instead a broken chain of pale streaks that on segments 4-9 separates the prominent pairs of blackish, forward directed, arrowheads; at the anterior of each arrowhead there is a large pinkish or ochreous blotch; the arms of the arrow are continued in dark brown until lost in the dark lateral shading: the series of arrows is continued to the head as a coarsely divided dorsal stripe, and to the anal flap as a thickened solid stripe. On the thoracic segments there is a fine wavy subdorsal white line and the pattern is repeated on the last segment; a lateral line along the abdominal segments is indicated by a series of pale fine streaks thrown into relief by the puckered and much folded skin and by the presence on segments 4-9 of a large dark patch at the anterior part of

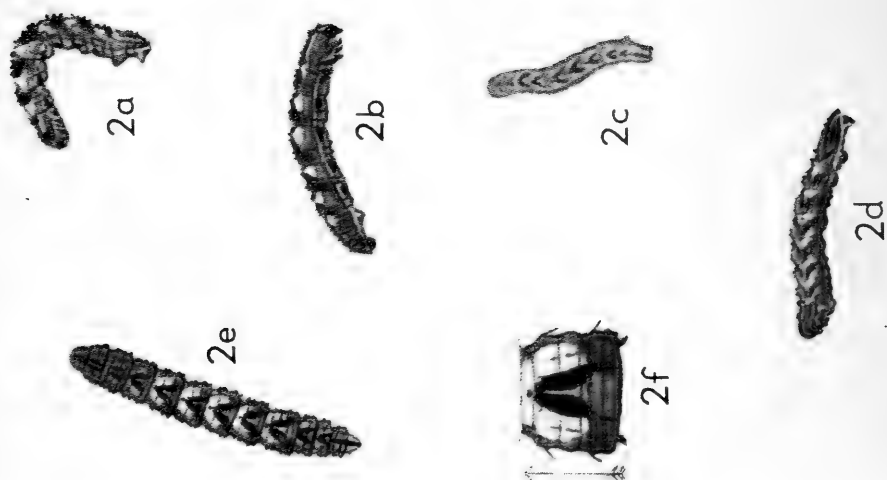
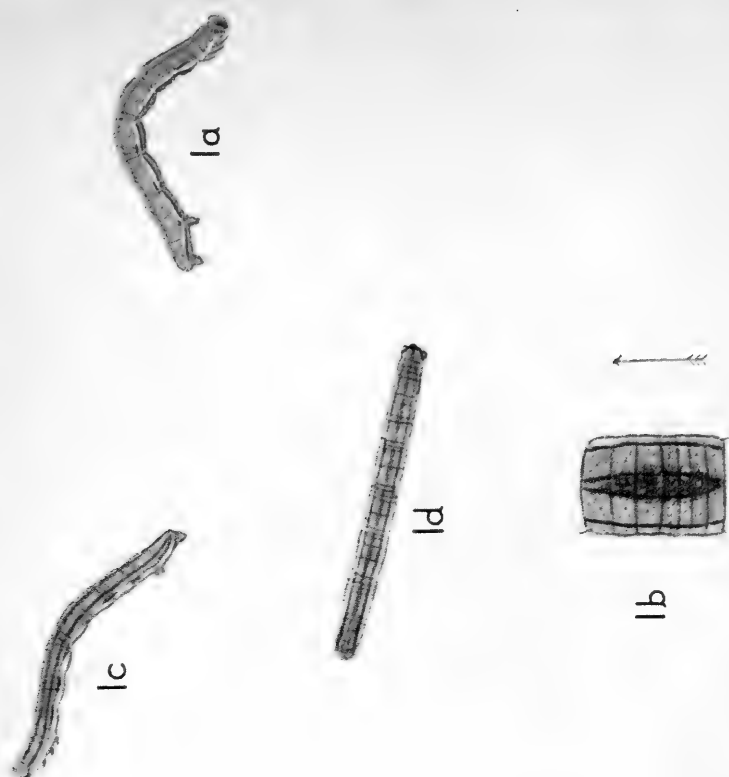


Fig. 1. *Eupithecia extensaria* Freyer.

Fig. 2. *Eupithecia millefoliata* Rössl.





each, placed immediately below the line. In paler specimens the lateral line may be edged by a dark band that is joined to the extended arms of the arrowhead markings. A row of four whitish warts is placed across the anterior dorsum of each abdominal ring with two widely spaced dark coloured tubercles at the posterior; on the thoracic rings there is a transverse row of eight dark warts; all carry a short sturdy hair, directed forwards on segments 1-6 and on the anterior part of 7, those of other segments pointing towards the anal end.

True legs pale brown marked with darker, prolegs dark grey brown, anal claspers dark brown with a broad pale streak down their length. Spiracles tiny, round, deep black and placed well up the segment above the puckered lateral line. Head dark greyish, narrow and much flattened, mottled with black freckling. The larva is a uniform pale brown beneath, its only ornamentation being a dark continuous central stripe that runs the full length of the larva. The skin is rough and granulated, much wrinkled transversely by deep folding.

When at rest the thoracic legs are held closely together and near to the head. The whole appearance of the larva is one of a short, stubby, warty creature.

It may be of interest to note that Dietze's figures of *E. santolinata* Mabilie in his *Biol. Eupith.*, 1913, Plate 33, bear an identical resemblance to those of *E. millefoliata*.

The head and appendages of the *millefoliata* pupa are yellow-green, those of *subfulvata* are red brown like the rest of the pupa.

*Figures*—Plate VIII, fig. 2; a, last instar, Folkestone, 7.x.51; f, dorsum of fifth abdominal segment; c, young larva, Chichester, 17.x.51; d and e, last instar, Chichester, 17.x.51. All on Yarrow seed heads.

#### *Eupithecia extensaria* Freyer. Scarce Pug.

The life history and habits of this pug are given in Vol. VIII, pp. 39-43, of Buckler's work from descriptions made by Barrett (1889) and Porritt (1892); the larva is described but no figures are given, the insect having been first discovered in Britain three years after the death of Buckler.

The species is still confined to the Yorkshire and North Norfolk coastline but it is locally common in the larval stage; it grows very slowly and may be found on *Artemisia maritima* L. from early August throughout September.

We are obliged to H. E. Hammond for the following note on the larval variation, which completes the descriptions given in Buckler.

Variation of the full grown larva is limited to ornamentation of the spiracular line: in its simplest form it is present as a thin white line placed on a plain green ground colour; the first development is a continuous edging below of dull dark green: the most beautiful forms have the line adorned by a series of bright red-brown stitches at the lower edge accompanied above by a red dot at the posterior of each segment, the stitches running from the fourth segment to the anal and varying

in intensity in different specimens. A further form has the red streaks joined by dark green, darker than the ground colour.

*Figures*—Plate VIII, fig. 1; a, c, d, all last instar, Wells-next-the-Sea, Norfolk, 8.ix.51, on *Artemisia maritima* L., received from G. Todd. b, details of dorsum of fifth abdominal segment.

*Eupithecia intricata* Zett. s.sp. *arceuthata* Freyer. Freyer's Pug.

The species *E. intricata* Zett. has many forms and races throughout Europe, and the identity of these is not helped by the confusing synonymy; the Scottish form commonly called *helveticaria* Boisd. was formerly the name-type of the species; another Scottish race—*anglicata* Mill. now known as *millierata* Wrnk.—which is found only in the Pentland Hills, is thought by Dr. de Worms to be no more than *helveticaria*. The status of the form *arceuthata* Freyer has long been a problem; Crewe thought it to be a separate species but Pierce could find little difference in the genitalia in the few specimens he examined; Prout said he had never seen British *arceuthata* and could give no opinion. We now recognise the southern England form to be the subspecies *arceuthata* Freyer with a distinct larva and imago and different larval habits from the Scottish *helveticaria*, the forms being thought to have been separated from each other in Britain since the earliest times, with possibly *arceuthata* a later arrival and *helveticaria* a survivor from the first glacial phase of the great Ice Age. Abroad *arceuthata* is said to be widely distributed over Central Europe.

*Arceuthata* had for many years been known as a casual capture in southern England but it had been called *stevensata* Webb., *ultimaria* Dup., *egenaria* H.S., *anglicata* H.S. and *tamarisciata* Freyer, and its true identity remained obscured.

The subspecies has a wide distribution over southern England and is now known from the counties of Hants (and Isle of Wight), Sussex, Surrey, Berks and Wilts, in the area east of a line from the New Forest through the chalk hills of Berkshire: possibly also in Eire.

The wild habitat is amongst Juniper (*Juniperus communis* L.) bushes on the chalk, but in recent years colonies have been discovered in gardens and shrubberies in other situations. Foodplants are now known to include various junipers, *Cupressus*, *Chamaecyparis*, *Thuya* and Tamarisk. The larva grows slowly, becoming full fed by late September and during October. The moth emerges from late May to July, passing the winter as a green pupa spun up in a loose cocoon on the foodplant.

*Description of larva.* The body is flattened and thick, short and rather stumpy, and somewhat different from the usual type of British *Eupithecia* larva: skin shiny and much wrinkled transversely, resembling a smooth sawfly larva. General colour a deep grassy green with a very dark green thin dorsal stripe, the subdorsals thin, pale yellow and bordered below with dark green. Spiracular line pale yellow or whitish and very wavy, giving an irregularly crinkled effect owing to much

puckering of the skin, the line fainter on the thoracic segments but very distinct along the abdominal, converging at the tip of the anal flap. All legs pale green. Head plain green and tucked well under the first segment when the larva is at rest. Intersegmental folds yellowish. Spiracles orange-red. The lateral lines vary from yellowish to clear white in different specimens. Beneath the larva is plain green and marked by a solitary clearly defined pale yellow line running from the fourth to the ninth segments.

Dietze's excellent enlarged figures of *helveticaria* (1913, *Biolog. Eupith.*, Plate 49, fig. 1) show a shorter, fatter and more dumpy larva with snowy white subdorsals only as short broken streaks at the intersegmental divisions; both this and *arceuthata* are figured with yellowish heads. K. Juul (1948, *Nordens Eupithecier*, Plate II, figs. 1 to 3) also shows *arceuthata* with an orange-yellowish coloured head.

*Figures*—Plate VII, fig. 2; a and b, last instar larvae, Arundel, on *Cupressus macrocarpa* Gord., 28.ix.51.

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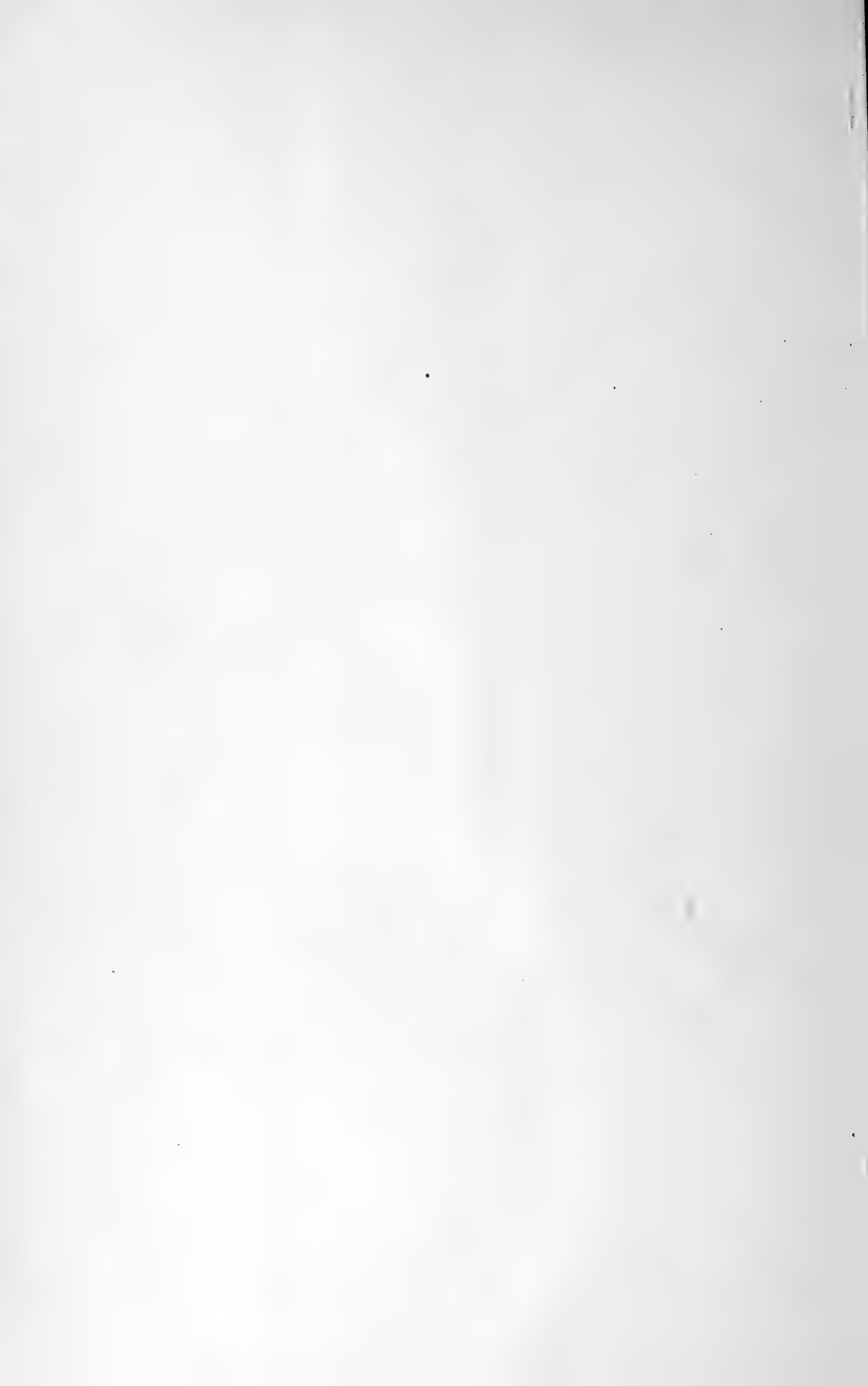
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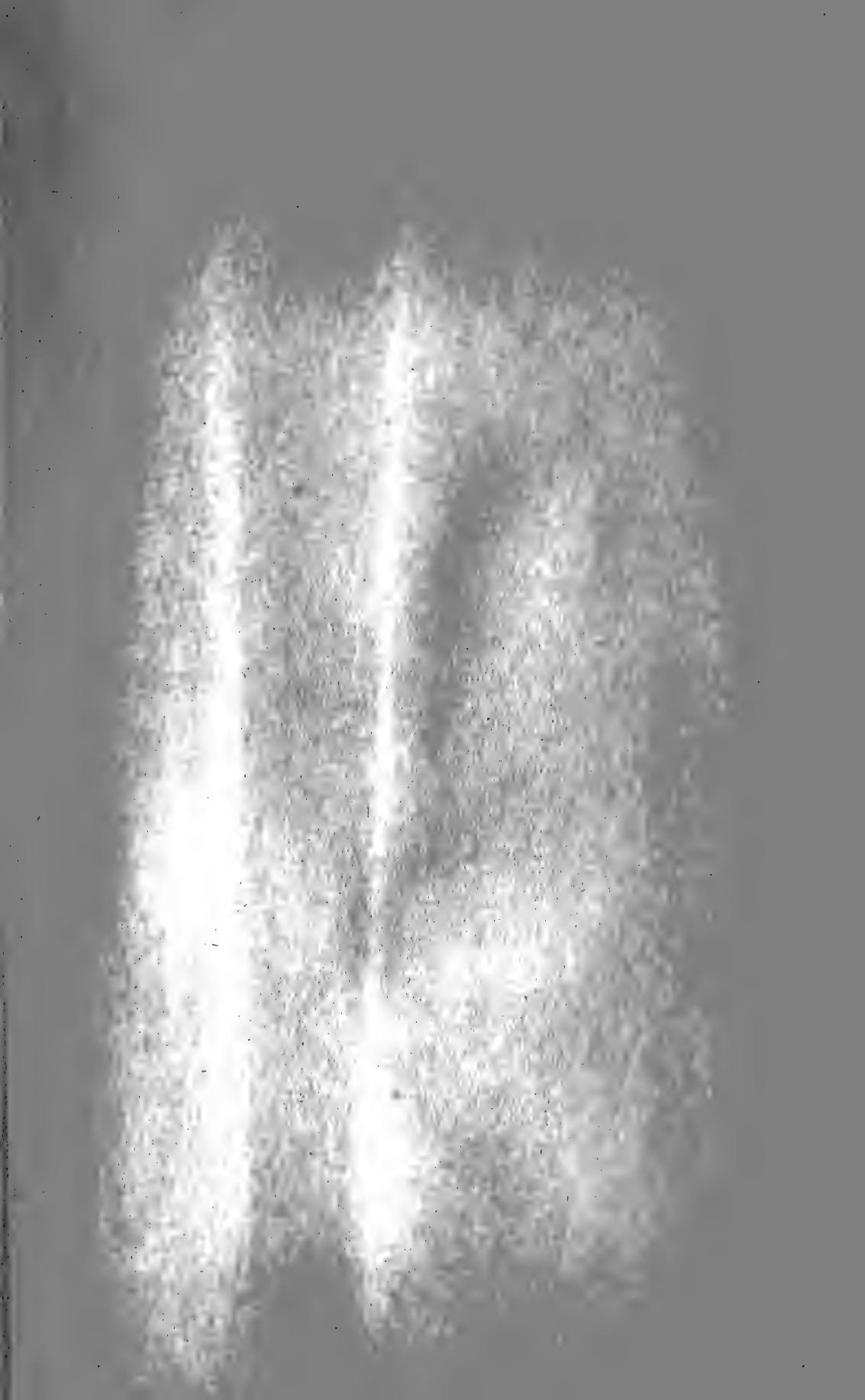
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